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Proceedings

OF THE

Sixth Annual Conference

OF

State, County and Municipal Health Officials

Held at
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October 13th to 16th,
1914

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REGISTER OF DELEGATES.

Albany	Dr. F. Reeve Woolsey, Health Officer.
Alhambra	Dr. F. E. Corey, Health Officer.
Berkeley	Dr. J. J. Benton, Health Officer.
Clovis	Dr. M. S. McMurtry, Health Officer.
Daly City	Dr. George L. Marion, Health Officer.
Fresno	Dr. L. R. Willson, Health Officer.
Hayward	Dr. F. W. Browning, Health Officer.
Inglewood	Dr. H. A. Putnam, Health Officer.
Irvington	Dr. H. Anderson, Health Officer.
Long Beach	Dr. Ralph L. Taylor, Health Officer.
Los Angeles	Dr. L. M. Powers, Health Commissioner; Dr. E. O. Sawyer, County Health Officer.
Marin County	Dr. J. H. Kuser, Health Officer.
Monterey	R. L. Anderson, Health Officer.
Napa	Alex Hull, Health Officer.
Oakland	Dr. Allen F. Gillihan, Health Commissioner.
Oakdale	Dr. Fred W. McKibbon, Health Officer.
Orange County	Dr. John Wehrly, Health Officer.
Pacific Grove	Dr. W. V. Grimes, Health Officer; Dr. D. L. Deal, President Health Board.
Palo Alto	Harold F. Gray, Health Officer.
Pasadena	Dr. Stanley P. Black, Health Officer.
Placer County	Dr. Theodore Snypp, Health Officer.
Richmond	Dr. Charles R. Blake, Health Officer.
Riverside County	Dr. George E. Tucker, Health Officer.
Sacramento	Dr. Norman E. Williamson, Health Officer. Dr. Donald H. Currie, Secretary State Board of Health. Dr. James H. Parkinson, vice-president, State Board of Health.
San Francisco	Dr. Wm. C. Hassler, Chief Sanitary Inspector. Dr. Edward F. Glaser, member State Board of Health.
San Gabriel	Dr. Ruth Purcell, Health Officer.
San Leandro	Dr. L. Michael, Health Officer.
San Luis Obispo	Dr. H. M. Cox, Health Officer.
San Mateo	G. A. Kertell, Secretary Board of Health.
San Rafael	Dr. W. J. Stone, Health Officer.
Santa Clara County	Dr. William Simpson, Health Officer.
Sonoma County	Dr. S. S. Bogle, Health Officer.
South San Francisco	Dr. Ivan W. Keith, Health Officer.
Ventura County	Dr. A. A. Maulhardt, Health Officer.

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Conference of health officers, Del Monte, California, October 12 to 16, 1914.

THE SIXTH ANNUAL CONFERENCE OF STATE, COUNTY AND MUNICIPAL HEALTH OFFICIALS

Held at Hotel Del Monte, California,
October 13 to 16, 1914.

The conference was called to order by the secretary of the State Board of Health, Donald H. Currie, M. D., at 10:00 a.m., Tuesday, October 13, 1914.

ADDRESS OF THE SECRETARY, STATE BOARD OF HEALTH.

It has been the custom in this State for the past four years to hold, in conjunction with the meeting of the League of California Municipalities, an annual conference of the several county and city health officers to confer with representatives of the State Board of Health, to discuss the various health problems that we have to meet. I need not say that this custom is a most excellent one, for you who have attended previous meetings know better than I the valuable ideas that have been thus developed. Meetings of this character, by bringing about a better cooperation and an exchange of ideas lessen somewhat the difficulties of your work, but even with such aid and the aid the State Board can give you, your duties as health officers are difficult enough—duties filled with petty and often annoying details, involving great responsibilities and compensated for with little or no pay and only too often much abuse.

One of the greatest surprises to me, when I first assumed office, was the total inadequacy of the compensation of our health officers. For example: There are not more than fifteen health officers in this State who receive $100 per month; about twelve receive $50 per month; and about the same number receive $25 per month; thirty-two of our health officers receive $10 per month; while with the exception of two or three who receive only fees, the remaining 250 serve without any pay whatever. Not only is this compensation insufficient, but very often the funds of the health officer are too limited to meet the expenses which he knows should be incurred, if sanitation and health are to be maintained. To procure these necessary funds he must go before his council or supervisors, describe conditions which confront him and request more funds. The members of the council or supervisors are usually of the mercantile class. They know and understand the need for streets, paving, electric lighting for their city, or, if a county, the needs of the business or ranching interests, but they do not know or understand their health problems and either must accept their health officer's statement of them, or reject the proposal made—very often they do the latter, or compromise by cutting down the health officer's request until the funds received fall far short of covering the measures he had hoped for.

In spite of these differences and discouragements, I consider it truly marvelous the amount of energy and time our health officers devote to the performance of their duty and the results which they accomplish, and this constitutes, in my opinion, another indication of the unselfish character of the work of the majority of our profession.

When the local health officer finds the situation which confronts him is too great to be met by the means he is furnished, he very properly refers the matter to the State Board of Health, and it has been our endeavor to answer all such appeals to the best of our ability. Sometimes, no doubt, it appears to the local health officer that the support we afford him is inadequate, but he should remember that several things have to be considered by us before extending our aid; thus, for example, we must have authority in law and the conditions must be of sufficient relative importance to allow us to expend our limited funds; we sometimes receive requests that would involve the expenditure of $50 or more in travel, and the abandonment of the executive work of the secretary in Sacramento for three or four days in order to inspect someone's dirty pigpen or decide a disputed diagnosis of a single case of smallpox. Such requests cannot be complied with when our small force is considered, and even if our force were larger some of the requests, if complied with, would be mere waste of public money. If the pigpen is dirty and is a nuisance, we will accept the local health officer's opinion, just as quickly as we would our own and, if he reports it to us, we will back him in abating it just as thoroughly as if we were there. Again, if the health officer says it is smallpox, we do not care how many other physicians say it is chickenpox, for he is our legal agent there and, furthermore, we prefer to accept, for reasons of safety, the graver diagnosis, and we will support him and his diagnosis just as though we had made it ourselves.

Other conditions arise, however—extensive outbreaks of dangerous, communicable diseases, such as the Hanford typhoid outbreak and the Mendocino-Humboldt smallpox epidemic—where we recognize the situation is too difficult for the locality, in which it has occurred, to handle it in a proper manner. In cases such as these, we tax our utmost resources to furnish such assistance as is necessary.

Owing to the area of this State and the limitations of our present force and funds, we often have conditions of a character intermediate between the above mentioned extremes which we desire to furnish more direct and material aid, but are unable to do so.

After considering many ways and means for bringing about a more effective public health machine for cooperating with the local health officer, it appears to me that a plan, similar to one recently adopted by Florida, would be desirable, *i. e.*, to divide this State into several districts (I would divide it into six or seven districts), and appoint as a representative of the State Board of Health, a full time district health officer to each of these districts, with authority to employ one or more assistants if conditions demanded. His duties would be advisory in character to the health officers in his district, and in case of need to use the powers of the State law to cooperate with the local health officers in meeting the conditions as they arise. These district health officers would visit Sacramento, if they deemed necessary, at the time of the regular meetings of the State Board of Health, to make their reports on their respective districts. Such appointments should be made on a merit system, the tenure in office to be indefinite and dependent on efficiency and good behavior, and the position to carry a sufficient compensation, not less than $3,000 a year. I believe this, or some similar addition to our force, would be of the greatest benefit to the health officers and sanitation of this State.

Next to a proper organization, the most important essential to the maintenance of public health is that the health officers of the State or community should be empowered by law to perform necessary acts looking to better sanitation and the control of communicable diseases. There are several state laws, some of which were passed at the last session of the legislature, which are of special interest to the local health officer, as he is often called upon to enforce them in his locality. I hope that these laws will receive discussion at this meeting and would appreciate it if anyone present who might have had experience in their enforcement will state how effective they are in actual practice, and make any suggestions as to alterations, additions, or repeals of the law or parts thereof.

I am especially anxious to hear about the vaccination law and how the several health officers find that it is operated in their own particular district. I fear from my observations, so far, that sometimes through its enforcement we succeed in impoverishing schools, thereby preventing both vaccinated and unvaccinated children from receiving education during an outbreak of smallpox, and at the same time accomplishing very little in forcing parents who are opposed to the procedure to have their children vaccinated.

Also, while discussing these laws, I would like to hear the experiences of certain health officers in securing cooperation, either in the enforcement of muzzling ordinances, to prevent the spread of rabies, or in the few quarantined sections of the State where quarantine of rabies has been instituted, the difficulties they met with in enforcing this measure, and in securing the cooperation of the peace officers in this work.

As you all know, there is a law on the statute books which makes it the duty of the State Board to prepare and distribute anti-rabic virus and the law is a most excellent one. As I have interpreted it, it is the intent of this act that we should distribute the virus to any person, through his physician, that is unable to pay commercial firms for the product, but we have found that in order to carry out the law strictly, and in the way it should be and was intended to be carried out, the expenditure would be far greater than the funds allowed us for the enforcement of this act, so we have had to content ourselves with the establishment of several branch laboratories throughout the State to administer this treatment, instead of distributing it to the physicians treating the cases, in the manner that commercial firms do. We hope the next legislature will grant us sufficient funds to perform this duty in the latter manner.

I think that those who have followed the work of the State Board will agree with me in my statement that of all the departments of our state health organization, the State Hygienic Laboratory is one of the most important, and I believe that the work we have performed there has been of the greatest value to the health officers and general public of this State, but the force of that institution is entirely too small to conduct the work in the manner we should like, and many requests that are received have to be curtailed. This is especially true of the examination of water, a work that requires a great deal of labor and which is not of a very definite value unless we can supppport it by having bacteriologists from the laboratory visit the water sheds; the laboratory findings alone being but one link in the chain of evidence, the condition of the water shed being even of greater importance in allowing one to reach accurate conclusions. I hope the next legislature will, therefore, allow us at least one more medical officer and one more assistant bacteriologist for this division.

The last legislature, as you know, established a tuberculosis division and owing to the influx of cases of this character from eastern states, as well as our own cases, there is certainly great need for work along this line. I believe that we have done as much as has been possible with the extremely small sum allotted for the Division ($7,500). We hope that what we have accomplished with this small sum will inspire the legislature to put sufficient confidence in that bureau to allot it a much greater sum for meeting the expenses of the work in the next two years.

One of the most important duties of the local health officer is to see that the data of vital statistics are collected. There exist laws requiring the reporting of certain diseases, the reporting of deaths and of births. It would seem that deaths are always reported, but the other data are not as complete as they should be. We are informed, for example, by private societies that have investigated this matter that not more than 73 per cent of the births of the State are reported. We know that such failure to report is not usually wilfulness, but often due to the carelessness of the busy attending physician, but it is too important a duty to excuse one from it, and we wish to urge that health officers be more stringent in enforcing the law relating to this subject.

As you know there is a law for the prevention of the contamination of streams that are used for drinking purposes and this office has been doing all in its power looking to the enforcement of this act, but in spite of our best efforts, as the community becomes more thickly populated, the surface stream, safeguard it as you may, becomes less and less safe as a source of drinking water, unless the water is treated by some of the well known methods before it is served to the consumer. It might, for example, be a theoretical possibility to prevent well defined communities from contaminating streams, but when we consider the topography of this State, with its ranches dotted over its surface, many of them near the banks of the stream, the porous character of the soil in some localities, and the precipitous nature of the water sheds, it is obvious that any disposition that the individual rancher may be able to make of his refuse can not assure that the nearby stream will not be directly or indirectly contaminated, either from surface waters or through ground-water supply. While I would urge health officers to be diligent in reporting all contaminations of surface water that may be used for drinking purposes, I venture to state that sooner or later our communities must realize that untreated water can not be considered safe for consumption unless it comes from high mountains or deep underground strata.

In the above brief outline, it is only my intention to open up certain questions in the hope that the health officers may discuss them freely to our mutual benefit.

In closing I wish to express my appreciation for the hearty cooperation of the health officers of this State during the short months I have held my present position. It is also a satisfaction for me to be able to state that I have received the support of every state official that my work has brought me in contact with, not only from the members of the State Board of Health, but from every department of the state government.

It was moved by Dr. Gillihan, seconded by Dr. E. O. Sawyer and carried, "that a committee of five upon permanent organization be appointed by the chairman and that we elect appropriate officers and that we request that we be recognized as the Health Officers section of the League of California Municipalities."

The chairman appointed the following as a committee on organization: Doctors Gillihan, Black, Simpson, Powers and Harold F. Gray.

REPORT OF COMMITTEE ON ORGANIZATION.

Your committee recommends that the State, county and municipal health officials affiliate themselves with the League of California Municipalities and that the chairman of this committee be appointed a committee of one to present the following resolutions to the League of California Municipalities now in meeting assembled:

"WHEREAS, State, county and municipal health officials of California are all intimately connected with problems of municipal health regulation and under the law often have joint jurisdiction within municipalities, and

WHEREAS, The different State, county and municipal health officials of California have annually held a meeting in connection with the annual convention of the League of California Municipalities, and

WHEREAS, These different State, county and municipal health officials fully realize the desirability of becoming an integral part of the League of California Municipalities;

Therefore be it resolved, That it is the sense of this meeting of State, county and municipal health officials that a request be presented to the League of California Municipalities, now in meeting assembled, to admit all such health officials to membership in the League of California Municipalities, to constitute and be known and recognized as the Department of Public Health of said League of California Municipalities."

Moved by Dr. W. A. Sawyer, seconded by Dr. Ralph L. Taylor, and carried unanimously, that the report of the committee on organization be adopted.

The chairman appointed Dr. Gillihan a committee of one to present the resolution to the League of California Municipalities then assembled. Dr. Gillihan subsequently reported that he had presented the resolution to the League and that it was accepted unanimously.

ROLL CALL OF DELEGATES.

CHAIRMAN: The next number on the program will be the roll call of delegates and each delegate is requested to respond by stating in two or three minutes what he considers to be his biggest public health problem.

Albany—Dr. F. Reeve Woolsey: How to get rid of millions of flies due to the making of wine in my territory.

Alhambra—Dr. F. E. Corey: The attitude of the people toward the reporting of diseases and the inconvenience which they are subjected to by quarantine.

Berkeley—Dr. J. J. Benton: Rabies; the handling of the minor contagious diseases and the enforcement of the vaccination law.

Daly City—Dr. George L. Marion: I should like to place before the meeting two things: First, the position of the health officer in a small city. I believe the health officer should have police powers; and second, the relation of the health officer to the examination of schools and school children.

Hayward—Dr. F. W. Browning: The enforcement of the rabies law and the enforcement of the regulations of the State Board regarding quarantine for diphtheria.

Inglewood—Dr. H. A. Putnam: The control of school children with infectious diseases and the need of cooperation between physicians and health officer.

Irvington—Dr. H. Anderson: Teaching the people what the health officer is and what he is trying to do; general education of the public; the great tendency of the people to conceal measles, scarlet fever and smallpox.

Long Beach—Dr. Ralph L. Taylor: The reporting of contagious disease and the lack of cooperation between boards of education and the health officer.

Los Angeles—Dr. L. M. Powers: Water supply, tuberculosis and disposal of sewage.

Marin County—Dr. J. H. Kuser: Sewage disposal in South Marin; providing sewerage for the new tracts of land and the disposal of garbage.

Monterey—R. L. Anderson: Sewage disposal.

Napa—Alex. Hull: Garbage disposal.

Oakland—Dr. Allen F. Gillihan: Adequate machinery with which to enforce health measures is the problem of greatest magnitude; housing problem, and the rabies situation.

Orange County—Dr. John Wehrly: Sewage disposal outside the incorporated cities; the need for some state action regarding a leprosarium.

Pacific Grove—Dr. D. L. Deal: The education of the public mind.

Palo Alto—Harold F. Gray: The enforcement of the state vaccination law; the adequate inspection of food supplies for a small community.

Pasadena—Dr. Stanley P. Black: The stamping out of scarlet fever; experiments with the sterilization of the effluent of an Imhoff tank.

Richmond—Dr. Chas. R. Blake: Water supply; supply of good milk for the city and the registration of births.

Sacramento—Dr. Norman E. Williamson: The use of raw Sacramento river water.

San Francisco—Surgeon R. M. Woodward: The housing problem at the close of the war in Europe.

San Gabriel—Dr. Ruth Purcell: The need of cooperation between the rich people and the health officer.

San Luis Obispo—Dr. H. M. Cox: Disposal of sewage and location of slaughter houses and hog pens.

San Mateo—G. A. Kertell: The proper disposal of garbage.

San Rafael—Dr. W. J. Stone: Securing reports of contagious diseases from the foreign population.

Santa Clara County—Dr. Wm. Simpson: The disposal of the waste of the county; what to do with the effluent from septic tanks and the distance from residences that septic tanks should be built.

South San Francisco—Dr. Ivan W. Keith: Securing reports of the minor contagious diseases among the foreign element and trying to get a trained nurse for school inspection.

Ventura County—Dr. A. A. Mulhardt: Enforcement of the vaccination law and the length of quarantine.

SECOND SESSION.

PRACTICAL MEASURES FOR THE CONTROL OF DIPHTHERIA.

Tuesday, October 13, 1914, 2:10 p.m.

The meeting was called to order at 2:10 p.m., James H. Parkinson, M.D., vice-president of the California State Board of Health, presiding.

CHAIRMAN: We will now have Dr. Browning's paper on "Practical Measures for the Control of Diphtheria."

DR. F. W. BROWNING, Hayward:—I have been asked to discuss the question of "Practical Measures for the Control of Diphtheria." The subject divides itself into three distinct classes: (1) Practical measures in the large cities; (2) practical measures in the small towns; (3) practical measures in the country districts.

I would not presume to discuss the practical measures required for the control of diphtheria in the large cities as my experience is limited to work in small towns and country districts.

Perhaps the best way to approach the subject for debate would be to discuss the practical application of Special Bulletin No. 6, entitled "Regulations for the Prevention and Control of Diphtheria," issued by the State Board of Health in August last.

A close, careful study of all the details of this bulletin must convince everyone that it is ideal and up to the moment in its provisions, and that if lived up to by health authorities, diphtheria will hereafter be kept under control. What are the prospects for the efficient carrying out of the regulations of this bulletin by the health authorities in small towns and country districts?

Here will be the "crux." Not because the health officer is unwilling to perform the extra work thus imposed upon him; nor is it because of the inefficiency of the health officer, though the present method of appointing these officers is far from perfect. It is because the town and county authorities have made no provision for the expenses incurred by so much detail work. The question of finance has been the bane of public health service at all times. Permit me to explain myself a little more in detail.

I take it that the conditions throughout the State are similar to what prevails in Alameda county, hence a brief rehearsal of the methods adopted and in operation in this county will suffice. I purposely leave out the city of Oakland and its contiguous towns, all of which might be classed as one city for the purpose of this discussion, and deal only with that part of Alameda county lying east of Oakland, to wit, the incorporated towns of San Leandro, Hayward, Pleasanton and Livermore, together with the unincorporated towns of San Lorenzo, Russell, Mount Eden, Alvarado, Newark, Centerville, Irvington, Mission San Jose, Warm Springs, Niles, Decoto, Sunol, Altamont, etc., and the seven hundred square miles of intervening country.

In accordance with section 3061 of the Political Code, each of the four incorporated towns has its board of health, which is supposed to serve without compensation, even as the board of trustees of said towns. It is an honorary position. There is no provision in the law for a health officer. There is, nevertheless, a health officer in each of these towns. How they have received their appointment I know not, except in my own instance, where the board of health recommended to the town trustees that I be appointed as such. One of the towns allows $10 per month to the health officer, another appropriates $300 per year for clerical services in the board of health, inasmuch as the plumbing and sewer ordinance is under its care and requires considerable clerical work. The other two towns I believe are entirely honorary.

So far as the rest of the county is concerned, with its seven hundred square miles of territory, it is under the care of a county health officer, at the nominal salary of $50 per month, out of which he has to pay all his expenses, including traveling and telephone. There is also a special health officer for a small section of one township, and another who has the responsibilities of another small section. These men were appointed by the supervisors under the authority of the last paragraph of section 4225 of the Political Code, which limits their compensation to a maximum of $100 per year, or $8.33 per month, out of which they also have to pay all their own expenses.

Inadequate compensation is nevertheless the least trouble of the public spirited man who accepts the office of health officer in these smaller communities. The time devoted to investigating each case of diphtheria, or suspected case, together with the time it requires to take swabs week after week of post diphtheritic cases, and carriers, as also the time required in hunting up contacts and missed cases, makes serious inroads on his private practice. Still more serious, however, is the animosity aroused in the minds of the friends of the patient, who do not and will not comprehend the import of the work being done to eradicate diphtheria from their midst.

There are few men, who, in the parlance of the street, will cut their own throats for the sake of the dear public.

There is yet another side bearing upon this question which I have experienced during the past few days. One of my confreres was called to a child with a sore throat; he took a swab which proved positive and the premises were quarantined six weeks ago. The child was clinically well in two days. Another physician was called to see a playmate of this child living next door, suffering from a similar affliction. No swab was taken, and the child was at school the following week. When I raised quarantine on the former case the father informed me very energetically that never again would he allow any swabs to be taken from members of his family if they had sore throats, neither would he call a physician to attend them, unless they were at death's door. There is reason in this man's assertions.

I firmly believe in the "Regulations for the Prevention and Control of Diphtheria," as published in Special Bulletin No. 6, yet I am just as strong in my belief that they will not be carried out to any extent in the country districts until our health laws provide for whole-time health officers.

So one of the first practical measures which I have to suggest is to devise some plan by which these very real obstacles lying in the way of the real enforcement of Special Bulletin No. 6 can be removed. In actual practice we have to meet an increasing, definite, and, in some cases, organized opposition to these regulations, caused in some measure by the action of some physicians in each community who will not make it a routine duty to have bacteriological examinations made of every sore throat, some even refusing to take cultures from any kind of a sore throat. The result is that many instances occur where neighbors engage different doctors for similar cases of sore throat; one doctor takes cultures which prove positive for diphtheria, and is quarantined, while the other does not take swabs and the case gets well subsequently to the other, is not quarantined, and immediately trouble begins over the conscientious physician and the health officer by the quarantined people and their friends. The doctor loses the family as patients and is *persona non grata* amongst their friends, while the health officer has one continual warfare with them until he raises the quarantine, and has made a large circle of enemies, thus stultifying his own reputation on which he depends for his livelihood.

If, therefore, the State Board of Health expects the doctors and health officers to carry out the provisions of this bulletin it must make an earnest effort to protect the physicians and country health officers, who, by force of circumstances, receive no compensation for the extra labor thus thrust upon them, and at the same time suffer financially by reason of the enforcement of these regulations in their private practice.

Discussion.

DR. J. J. BENTON, Berkeley: I was greatly interested in the Doctor's paper. In the handling of contacts it is my custom to take cultures from all the contacts. I think that in all communities, whether it be in small or large communities, if cultures were taken from all contacts it would lessen the spread of the disease. In the schools the principals know how to recognize the premature indications of different diseases and in this way we oftentimes get a carrier. It is quite a problem to get the cultures taken. The physicians generally take these, unless the last one for release, which I like to take myself. I think that the board's bulletin is an excellent one and I think it can be carried out in the details, if we make up our minds to do so.

DR. STANLEY P. BLACK, Pasadena: It seems to me, in the eight years of experience I have had, that dipththeria has been the easiest controlled of all the communicable diseases, because we know the organism and we know how it is carried. When there is a case of diphtheria in the schools I go through the whole school and take cultures from the children, the teachers and the janitors; in that way I find the carrier.

DR. WAID J. STONE, San Rafael: When one of our schools opened for this session the principal phoned me that some of the children were coughing. I visited the school and was surprised to find about six children who had whooping cough. The physicians were not giving me support and were not reporting cases. There are a number of foreigners who send their children to the city schools. These people do not understand English and do not know that they should report sickness to the health officer. If I could secure through the State Board of Health and through the state printing office sheets of linen on which the laws and regulations relating to the reporting of communicable diseases could be printed in Italian and Portuguese, I could have them posted in conspicuous places and I know they would be read. If these people understood that it was the law to report sickness I know they would do so.

Dr. E. O. Sawyer, Los Angeles: I sent my deputy down to let a diphtheria case out, after two negative cultures. She found a family of children with sore throats and one of the children had died. The death certificate said "heart trouble" and the physician who attended the children was the health officer. What are you going to do about it?

Dr. F. E. Corey, Alhambra: The requirements of the state board do not demand the reporting of tonsilitis and it is a cover for diphtheria. In many instances the physician says it is tonsilitis when it is really diphtheria. I think if this disease was made reportable the health officer would find many more cases of diphtheria.

Harold F. Gray, Palo Alto: In the handling of diphtheria in my city the physicians almost regularly take a swab which is supplied by our laboratory. Sometimes they want to know what is the matter with the child and they send in a swab for all sore throats. Dr. Browning has mentioned the time lost in getting reports from the hygienic laboratory and I would suggest that every small city should establish a small laboratory.

Dr. F. W. Browning, Hayward: I think the health officers feel that the state board requires too much clerical work on the part of physicians and health officers.

Dr. Donald Currie: I think that there is no question that the law requires a great deal of clerical work on the part of health officers and physicians. The state board only expects a man to do the best he can; we fully realize that the salary is very small and the duties are multiple in some districts.

ADMINISTRATIVE PROBLEMS PRESENTED BY MEASLES AND SCARLET FEVER.

Chairman: We will now have a paper by Dr. Garth Parker, health officer of Monterey county on "Administrative Problems presented by Measles and Scarlet Fever."

Dr. Garth Parker, Salinas: As far as the administrative problems presented by measles are concerned, it seems to the writer that the greatest problem with measles is whether or not we recognize in this disease, one that is serious enough to warrant stricter methods of handling or controlling it. This brings to the front the question as to whether quarantine or isolation of measles is justified or not.

When we look over the morbidity reports we always see quite a few deaths charged up to measles, and when we take into consideration the fact that sometimes the more remote complications and sequelæ are not considered, the death rate would perhaps be higher. The mortality of measles varies in different epidemics among different races and in different ages. The mortality is very high among the aboriginal races of different parts of the world. In this country, Holt gives the death rate from four to six per cent and Osler from two to three per cent. The death rate is usually very low in robust children, but in epidemics among young, healthy adults, where there is no inherent immunity, the death rate is quite high from this disease.

The complications, of course, are very well known, and need no mention, but one of the most common sequelæ of measles is tuberculosis and there are very few practicing physicians who have not heard the statement "caught cold after measles" to explain the onset of a tubercular process.

Among the laity, the idea prevails that measles is a harmless disease, and is almost necessary to the growth of the child. In a large percentage of cases, no physician is called in at all, and the case is treated by home remedies, and there is no restriction whatever, and the patient is allowed to go to school and mingle with his fellows long before it is best for himself or for the other pupils. There is an absolute unwillingness to keep mild cases away from school, and there is a disposition upon the part of most parents to force their children to their studies before the patients cease to be a danger to the rest.

Very often there are cases that are hard to differentiate between a mild scarlet fever and mild measles. These are a grave cause of danger. They give the patient and the family a false sense of security; the patient itself is in danger; likewise, the rest of the family and the neighborhood at large. Very often a severe scarlet fever epidemic is allowed to gain ground in this way.

When we realize that measles is not the innoculous disease it is supposed to be; when we realize that many cases of tuberculosis are dated from an attack of measles, and we acknowledge that the former disease is itself limited; that treatment has very little or no effect upon it, why not, then, use more stringent means for its isolation and quarantine? There are hundreds of lives given up every year throughout the United States due to the supposedly harmless disease or its complications, and it seems well worth while that the trouble of isolation of a few cases in their inception and cutting short the epidemic would save many lives.

One of the problems that the writer has had with quarantine work in general, and in scarlet fever in particular, has been the difficulties that he has met with a colony under his jurisdiction where one of the many mental healing cults is followed. There was one case in particular of scarletina in one of the children of one of these families. The child was forced to attend school, much against its will, and it was only when a well defined rash appeared that the school authorities took recognizance of the case, and the child was then denied the permission of remaining at school, and was sent home, not unwillingly. This brought about an investigation, but exposure had been made then to a large number of the students, and the result was that a well defined epidemic of scarletina was spread among the residents of that particular neighborhood. These mental healers do not realize that there are citizens who do not agree with these ideas, and demand protection of a more material form. The remedy that the writer has used with this class of persons has been the help of a deputy sheriff.

The greatest problem in regard to scarlet fever is the length of time of quarantine and isolation. The policy followed in Monterey county has been to enforce the quarantine when there were lesions present in the throat or ears, or other symptoms which might be regarded as dangerous.

The whole question of quarantining scarlet fever will never be absolutely satisfactory until the bacteriological cause is settled upon. While a majority of the investigators claim to have found one of the strains of streptococcus present in all of these cases, others have differed, and until the bacteriological cause is absolutely settled and accepted by all, and our clinical work checked up with the bacteriological findings, then our quarantine for this disease must be more or less empirical.

Discussion.

DR. F. E. COREY, Alhambra: I have been very much interested in Doctor Parker's paper, especially his method of fumigating the Mexican shacks. I think I shall adopt the doctor's method in the future. Speaking of these two diseases makes me think that if we only knew where the infection comes from we would be better able to handle them. Now, in regard to measles, the period of incubation is so early that by the time we hear of a case it has become eruptive and the child has probably been conveying the disease to a large number. The difficulty in the control of measles lies in the fact that we can not get hold of it early enough, if we could feel justified in taking the child in hand before it shows any eruption we might be able to check its spread. I must confess that I was much amazed in looking up the deaths reported from this disease to notice a great many reported in the state reports—in some of our bulletins there were more deaths reported from measles than from scarlet fever. I never have seen a fatal case of the disease. Scarlet fever is in a similar class, where its infection comes from nobody knows. I feel sure that I have had cases contracted from the measles. The best means I have ever found for getting control of scarlet fever is by warning the parents of the after effects, as I have had children die of nephritis, following scarlet fever. With that idea in the minds of the people I find a very great willingness to report cases and to submit to quarantine. There is a great unwillingness on the part of some people to report cases of any disease, they will not call a physician for measles or scarlet fever because they say that if they call a physician they will be quarantined.

DR. H. ANDERSON, Irvington: I have observed in my section a disposition on the part of the people not to call a physician to attend measles. It is not overstating the fact to say that not one in five ever has a physician in attendance.

DR. WAID J. STONE, San Rafael: As I suggested before, if the State Board of Health could furnish us with some literature that the foreigners could understand they would report. The supervisors are unwilling to have an interpreter write the rules and regulations for me, but I can not get measles and the minor communicable diseases reported otherwise.

DR. J. H. KUSER, Marin county: We will get very few reports of measles until we educate the people up to the need of reporting it. We have missionary work to do along this line.

DR. STANLEY P. BLACK, Pasadena: Quarantine for measles is useless after the eruption has broken out.

DR. NORMAN E. WILLIAMSON, Sacramento: I think we get very poor results from quarantining measles. I think it is better to let the children have measles and be done with it.

DR. GARTH PARKER, Monterey county: I realize that the question of quarantining measles is a most difficult one and that the disease is one of the most contagious ones with which we come in contact. As Dr. Kuser has said, educating the people is the great factor in the matter.

PRESENT DAY PROBLEMS IN THE CONTROL OF SMALLPOX IN CALIFORNIA.

CHAIRMAN: We will now have Dr. Gillihan's paper on "Present Day Problems in the Control of Smallpox in California."

DR. ALLEN F. GILLIHAN, Oakland: That vaccination is the only efficient means of controlling smallpox is such a well demonstrated fact that I feel I would be offering an insult to the intelligence of this assembly if I were to occupy my time in adding further proof to this statement. Therefore, "Present Day Problems in the Control of Smallpox" resolve themselves into "Methods and Means Whereby the Health Officer may Secure a more Thoroughly Vaccinated Community."

These methods fall under three heads:

1st. Overcoming popular justified antagonism against vaccination by improving the technique of the act.

2d. More energetic enforcement of existing laws regarding smallpox contacts and possible contacts.

3d. Better enforcement of the school vaccination act of 1911.

I. I can very well understand that the general public should show great antagonism against vaccination. I have in mind our experience during the epidemic of smallpox in Berkeley early last year. At that time we were vaccinating several hundred per day and dressing as many more, *i. e.*, our vaccinations of the week previous. In the course of our work we found a number of children who possessed certificates of recent successful primary vaccinations but who had no scars. For this reason the board of health passed the resolution that during the epidemic no child would be readmitted into school until he showed physical evidence of successful vaccination as determined by the health officer or by a member of the board. The examination of these scars gave us an excellent opportunity to compare the technique of vaccination as used by the board and that used by the general practitioners. My predecessor in office has said that, judging by his experience, the least harmful thing the general practitioner could do was to vaccinate. I can but add to this that in my observation the most unsatisfactory work of the general practitioner was his method of vaccinating. To call this work sloppy would be using a mild expression. The nurses assisting us called these outside vaccinations "poultices."

Picture a child vaccinated ten days to two weeks ago coming in with a mass of gauze and bandage tightly fastened around his arm, the reddened and inflamed area appearing even beyond the edge of the bandage. Beneath this bandage and gauze almost invariably was found some one of the various shields recommended by those interested in their sale; beneath this shield could be seen a nasty, discharging, and foul smelling ulcer the size of a 25c piece; the arm was swollen and red, frequently from shoulder to elbow, subaxillary lymph glands so inflamed that the arm could be moved only with great difficulty, the whole thing exquisitely painful, the child the picture of discomfort, and the parent thoroughly wrought up, telling us that never again would he allow his child to be vaccinated.

These children came to us for examination for readmission to school, and in order to issue certificates it was necessary to see the wound. We made it a practice *never* to discuss the condition of the wound, but replaced the dressings and told the parent to take the child back to his doctor for dressing. While they were still in the room, they would see several of our vaccinations dressed; three distinct, sharply circumscribed, unbroken vesicles never over one third to one seventh of an inch in diameter, no discharge, no odor, and comparatively no discomfort. The comments these people made were, to say the least, most interesting. No wonder the average physician objected most strenuously when his vaccinations were examined. Naturally he would be ashamed of the quality of his work.

The tales one hears of infections, ulcers that run for weeks, the blood poisonings, are all more truth than imagination and justify the public in fighting vaccination.

Nasty discharging wounds go with the days of laudable pus, and no wonder the average intelligent citizen in these days of clean surgery looks askance upon the loathsome vaccination. The citizen has forgotten or never knew what the word smallpox meant, but he does know of the very unpleasant results following the average vaccination. The day of laudable pus has passed, the day of low grade vaccine has passed, and now there should be no more excuse for a sloppy vaccination than for pus in clean surgery. I feel very strongly that it will not be possible to obtain the cooperation of the people for universal vaccination until we improve the technique of our work and eliminate the many just causes for complaint.

I knew that the *quality* of the vaccinations made by the board of health of Berkeley did more toward getting people vaccinated in that city than all the orders ever issued, the people soon learning that our contentions were true, namely, that vaccination when properly done and properly taken care of, did *not* produce harmful results.

Since assuming charge of the Oakland health office about 4,000 vaccinations have been done and I have yet to hear of one harmful result following. The method used is almost identical with that used in Berkeley during the February, 1913, epidemic and similar to that used by Dr. Force in the University of California. It is as follows:

The skin of the arm over the region of the insertion of deltoid muscle is thoroughly cleansed with sterile cotton, and commercial ether. Three circular abrasions about two mm. in diameter, and about a centimeter apart, are made by rapidly twirling a sterilized No. 4 dental chisel when in contact with the skin, very light pressure being used, and the skin tightly stretched during the abrasion.

These abrasions are just sufficiently deep to remove the superficial layers of the epithelium. The vaccine is applied to the abrasions either directly from the original capillary container, or from a one cc. bottle of glycerinized vaccine by means of a sterile wooden toothpick. The surface is immediately covered by a dressing of four to six layers of sterile gauze about three inches square, held in place by one-inch Z. O. plaster strips around the edges. Under no conditions may the plaster be applied over the gauze in such a manner as to come directly over the abrasions. The use of any form of shield is positively interdicted.

It is my custom to stamp upon the adhesive, the legend "Vaccinated by Dr. Allen F. Gillihan, Health Department, Oakland, Cal." Dr. Force stamps his vaccinations with the date on which the patient is to return for dressing, the use of the date serving as a reminder to the patient when to return; the use of the name or date stamp serves as a means whereby the vaccinator may identify his original dressing.

Vaccination.

I desire to draw your attention to several important factors in the above technique.

1st. The absence of powerful antiseptics, the ether which is mildly antiseptic removing grease and drying almost instantly.

2d. The method of abrasion, a minimum amount of epithelium being removed by a process that is practically painless, no blood being drawn; the three abrasions can be made in less than one second.

3d. The avoidance of cross scarification and scraping as prohibited in Germany.

4th. The compliance with the requirements of the British Royal Commission on Vaccination, *i. e.*, three or more spots resulting in well pitted scars covering a total area of at least one half a square inch of surface.

5th. The immediate application to the vaccinated surface of a sterile dressing.

6th. The use of gauze dressing.

The shield is an abomination; it retains heat and moisture, moistening and softening the tissues of the vesicle, favoring free discharge. The gauze freely protects the wound, does not retain the heat and allows the moisture to evaporate, thus allowing for the drying out of the pustule and the rapid formation of a scab.

After the dressing is applied the patient is admonished (1) not to scratch or rub the arm; (2) not to get the dressing wet; (3) not to pull off the dressing; (4) to return in one week for dressing.

The dressing is removed at the second visit, one week after vaccination, the rubber from the plaster and discharge from the wound, if any, are carefully wiped away with ether and sterile cotton. Quality and condition of wound are noted, and fresh dressing applied, and the patient is told to return in four or eight days if the arm bothers, otherwise to leave the dressing on for ten days.

If at the second dressing it is seen that no reaction has occurred, the vaccinator revaccinates the patient and instructs him to return in three days. The revaccination wounds are then examined and their condition noted; the patient is now instructed to return at regular dressing time, that is, one week after the revaccination. If vaccinator notes at that time that a reaction observed at the third day observation has subsided, he may issue an "Immunity Certificate." If no reaction is noted, either at the third-day dressing, or at the eighth-day dressing, and the vaccinator *knows* he has used an actively potent virus, he is justified in feeling that either

First—He employed a defective technique; or

Second—That deliberate removal or destruction of the virus has occurred.

With the excellent quality of vaccine now obtainable, if the suggested method were adopted I feel satisfied that the popular antagonism against vaccination would be overcome very quickly.

II. More energetic enforcement of existing laws regarding smallpox contacts and possible contacts.

Section 2979 of the Political Code, 1911, makes it the duty of every local health officer "to take such measures as may be necessary to prevent the spread of certain diseases," among which will be found smallpox. I feel this is sufficient authority for the health officer to energetically search out each person who may have been in contact with the smallpox patient, to vaccinate these contacts or to hold them in quarantine until he receives definite instructions from the State Board of Health or until the period of incubation shall have passed. Few if any will be found to spend three weeks in quarantine when they are told that by being vaccinated they could escape quarantine. Many are the excuses, usually manufactured out of whole cloth, that will be offered and great pressure brought to bear to evade vaccination, but when the health officer remains firm and these people learn that it is a case of vaccination or quarantine, they invariably select the vaccination. For example, smallpox in an apartment house in which the occupants used a common entrance—I would feel justified in vaccinating every soul in the building, even if there were 50 to 100 apartments, and not merely the occupants of the one apartment, as the patient may have come in contact with any one of them in the common hallway; and similarly in a large factory or school, or in a train.

III. The enforcement of the school vaccination act of 1911.

My understanding of the intent of the vaccination act of 1911 is that every person attending school should be successfully vaccinated once in seven years. Expressed in other words, each person in school should have his immunity against smallpox proven or reestablished every seven years.

Immunity established vaccination or even by smallpox itself is a relative matter; with some individuals this lasts for life; with others it lasts for a few years only. I feel the act is right in demanding evidence of immunity once in seven years from everybody. I would prefer it be once in five years.

Apart from dead virus, error in technique, and the deliberate removal of virus after vaccination, I personally do not believe that there is such a thing as *no reaction*; and for that reason I never issue a due diligence certificate, such as is allowed under the act. I consider due diligence to be a failure on the part of the vaccinator. I firmly believe that each person properly vaccinated with an active virus will develop some reaction.

It is indeed strange that until very recently close observation of the various reactions of vaccination was not made. No classification of any value existed, the physician rarely seeing the patient till the eighth day and then being usually satisfied with a "take" or "no take." Force following the work of Von Pirquet has offered a classification into vaccinia, vaccinoid and immunity reaction—vaccinia being the reaction of successful primary vaccination in a person who had never been vaccinated before, and who had never had the smallpox. Vaccinia produced by the method just suggested usually runs a mild course; it is rarely necessary for the patient to return for a second dressing. The vesicle is quite typical, rounded, umbilicated, firm, about a centimeter in diameter, and seldom broken. The scar produced is circular, almost a centimeter in diameter, and invariably well pitted.

Vaccinoid.—Just as we speak of a person who has a smallpox modified by a successful vaccination years previously as having varioloid, so the term vaccinoid is used to describe a successful vaccination in a person who had previously had smallpox or previously been successfully vaccinated, but whose immunity had in time become greatly diminished. The vesicle of the typical vaccinoid is nearly always irregular, very thin and easily broken. The size varies from a few millimeters to over a centimeter in diameter. The scars are very rarely deeply pitted. The course varies directly with the degree of immunity. In an individual whose protection by previous vaccination or variola has nearly disappeared, the course and appearance of the vaccinoid will approach closely to that of a vaccinia; in one whose protection is but slightly impaired, the course will be markedly shortened, and the reaction proportionately mild.

The reaction upon a person possessing complete immunity through a previous smallpox or previous successful vaccination was designated by Force "immunity reaction." This reaction consists of an inflammatory papule about four mm. in diameter and reaches its maximum growth within 24 to 48 hours after inoculation. It subsides usually within three or four days and leaves no characteristic scar.

Force very tersely says: "If specific antibodies were present in the blood of the individual, the vaccine matter would be promptly digested. If specific antibodies are not present, but the power of forming them still persists, the vaccinia organisms may begin to grow. This growth is checked as soon as the antibodies are sufficiently developed. Clinically we see a scale of appearances ranging, from 'early reaction' and 'torpid early reaction' through many types of 'accelerated reaction' or vaccinoid, depending on the length of time between the inoculation and the appearance of the antibodies.

"The varying clinical pictures ranging from 'immediate reaction' to true vaccinia must all, therefore, be regarded as successful vaccinations, since they are witnesses of the formation of antibodies and the consequent restoration of immunity. Figuratively speaking, the further the clock has run down the longer it takes to wind it up."

In considering these reactions it must be remembered that only a known actively potent virus may be used—a virus with which the vaccinator is obtaining true primary vaccinias coincident with his tests for immunity; an inert virus may produce an immunity reaction in an immune or partially immune individual.

A word might be said here regarding careless methods of handling vaccine. Heat we know very readily kills the active principle; cold even to freezing does not harm it, therefore, the vaccine should be kept on ice, not in a warm showcase or drawer, or in the physician's vest pocket, as I have frequently seen. Carelessness in this particular is responsible for a great number of the failures in vaccination.

My experience leads me to thoroughly agree with Force in considering this reaction, or "immediate reaction" as Von Piquet calls it, or "sudden cuticular inflammation" as Jenner spoke of it in his original paper, as being evidence of full immunity in the individual and therefore successful vaccination.

By availing oneself of this immunity reaction one could enforce the act without arousing the antagonism that would be aroused under the take or no take method. A certain no small proportion of those involved under the law are immune; by putting these immunes (as they feel) to the unnecessary inconvenience and (usually also) expense of being revaccinated each school year in order to obtain a due diligence certificate which would carry them for one school year only, their antagonism to vaccination is most surely aroused. Very many of these immunes are teachers; and we need the cooperation and assistance of these teachers, not their antagonism, if we hope to get children vaccinated.

The state law very rightly says nothing about exempting those who have had smallpox from vaccination once in seven years. I know health officers frequently accept these certificates of having had smallpox as the equivalent of a successful vaccination. It might surprise you if you were to vaccinate the holders of these certificates to find many developed true vaccinia. Such certificates are not accepted in Oakland, and we even find well pock-marked persons giving excellent vaccinoid reactions, indicating that their immunity was failing. Incidentally I have seen scarification from acne resemble a fading smallpox scarification very closely and be passed off as such to obtain school entrance certificates.

A few words in closing upon methods of registration of vaccination certificates. The state vaccination act states that the local health authority "shall make and preserve a list of those children and persons who have been successfully vaccinated within seven years prior to date of filing, with the date of said vaccination and a separate list of those who have not been so vaccinated," etc.

After trying out several methods, the following has been adopted as the most satisfactory: The maintenance of one big file of successful vaccinations upon card index system.

Our Oakland list contains upward of 35,000 names. At the time that vaccination certificates are being examined in the office, and the stamp of registration put upon the back of each certificate, a card is made out, giving name, date of vaccination and address. After all the certificates received that day have been thus disposed of, the clerk then files the cards in the large index system. In the event of her finding the index already contains a card for that name, date and address, one of the cards is destroyed. It is much more economical of time to make out all the cards at once and compare with the index in act of filing than it would be to compare each name as each certificate is examined. Of course, certificates possessing our "registered" stamp on the back are not sent to the health office from the school, but we very frequently have the health officer's evidence certificate to enter.

Many children (fully ten per cent) lose their certificates of vaccination and the health officer must issue the evidence certificate. We do not accept evidence certificates from any one but the health officer, as required under the act.

We have found this method of registering and filing most economical of time. One girl repeatedly examines, registers, makes out and files cards for six hundred to eight hundred certificates in a day of seven hours. The "opposed" and "due diligence" certificates we file alphabetically under the school concerned. They are valueless. Although they are demanded and obtained very little time is wasted on them. The superior court and the appellate court have ruled that the conscientiously opposed section of the act is unconstitutional.

The following example was used, granted that quarantine was effective in the control of some disease and that the state law required its enforcement, and a person would not be allowed to evade quarantine simply because he was conscientiously opposed to quarantine:

In event of smallpox appearing in the city and the State Board of Health declaring an exclusion district exists, the principal of the school is immediately notified to provide the health office with a true copy of all persons, employees, teachers, pupils and others in the school. The clerk compares the names on this list with the index and erases those names on the list whose cards are on file. The persons left are then vaccinated or excluded from school. Several times a list of one thousand names has been compared with the index in a day since this method was started.

When an act of legislature is not enforced or is evaded or twisted, the public gets to have very little respect for it, and it then becomes most difficult to enforce. But by living up to the letter of the act the public develops a most wholesome respect for it and its enforcement becomes a simple matter.

Conclusion.

I. A better technique in vaccination would educate the public to have less dread of the act, and it would become less difficult to get them to submit when necessary.

II. Getting all contacts and possible contacts would cut down the number of cases per year very materially. Refer to work in Philadelphia beginning in 1904.

III. Enforcement of vaccination act. These three factors, if fully worked out, would result in such a thoroughly vaccinated community that it would be almost impossible for smallpox to appear.

DR. POWERS, Los Angeles: The paper of the doctor is very excellent. The control of smallpox in California must be as conditions are now and not as the doctor or I would have it. We had a great deal of trouble until we had a great many cases and some deaths. When we had some deaths in Los Angeles they were very willing to come in and be vaccinated as soon as they found that smallpox was fatal. We have treated eight hundred cases without a single death. I have had fellows tell me "I would just as leave have smallpox as be vaccinated." The mild forms of the disease have been the cause of the people refusing vaccination and also the idea that you are injecting a poison into the body. The question of quarantine is difficult, because you can not get all of those that have been exposed. It is not the fellow living in the house that is always exposed; many times the fellow that has been exposed lives and goes to another town. I have had many people come to me with smallpox from Omaha, Chicago and eastern points. Those are the cases that spread the disease. When I find a case like this and know where the people have gone who were exposed, I telephone to the health officer and tell him.

DR. J. J. BENTON, Berkeley: The paper of Dr. Gillihan was very interesting and the portion of it that I am very anxious about is the enforcement of the vaccination law. I would like a ruling from the State Board of Health as to whether a "due diligence" certificate should be accepted after one year, when you have had two efforts made to have the person vaccinated? Shall it suffice for one year or for seven years? And, also, whether we shall accept an "immunity reaction" certificate?

Harold F. Gray, Palo Alto: As to whether the local authorities have the right to accept "immunity reaction" certificates, I believe that the city may make such rulings as it pleases.

Dr. L. M. Powers, Los Angeles: I would like to know how many there are here who enforce the full context of the law?

A count was taken and it was found that four out of the nineteen present enforced the full context of the law.

Dr. John Wehrly, Orange County: How would you enforce the vaccination law in a country school district?

Dr. Donald H. Currie: The health officer designates the district and the children are kept out of the schools in the district so named.

Dr. S. S. Bogle, Sonoma County: They pay our schools in proportion to the attendance and many times in sparsely settled districts the enforcement of the law so decreases the attendance that they have to close up.

Dr. F. W. Browning, Hayward: Is this vaccination law carried out to any great extent in the State?

Dr. Donald H. Currie: The State Board of Health instructs all health officers to carry out the law and we keep after them until they do so.

Dr. Allen F. Gillihan, Oakland: I was not trying to defend the present law, I was trying to enforce it. I feel that the law is enforceable.

CHAIRMAN: There being nothing further to come before the meeting it will stand adjourned until tomorrow morning.

THIRD SESSION.

Wednesday, October 14, 1914, 9:50 a.m.

The conference was called to order at 9:50 a.m., James H. Parkinson, M.D., vice-president, State Board of Health, presiding.

COOPERATION BETWEEN HEALTH OFFICIALS AND FOOD INSPECTORS.

CHAIRMAN: We will have Professor Jaffa's paper on "Cooperation between Health Officials and Food Inspectors."

Prof. M. E. Jaffa, Berkeley: Experience of several years in connection with the enforcement of the pure food and drugs act has emphasized the necessity of cooperation between health officers of the counties and cities and the bureau of food and drugs, the division of the State Board of Health which is directly concerned in carrying out the provisions of the law.

There are several different ways in which this cooperation may be effectively and efficiently carried on. Among them may be mentioned the following:

(1) Conferences between state food and drug inspectors and health ·fficers.

(2) Correspondence with the food and drug laboratory.

(3) Excellent results will be obtained by the health officers acting as unofficial inspectors for the State Board of Health and reporting to the state food and drug laboratory of evidences of violations of the food and drugs acts.

(4) The health officers can cooperate in no better way than by assisting in the education of the consumer.

Let us discuss these different methods seriatim.

(1) The health officer is fully conversant with the existing conditions in his locality. The state food and drug inspector is not likely to be so well informed on this point. Therefore, considerable valuable time would be saved by a cordial conference between the health officer and the visiting inspector. The health officer can suggest where it is necessary to concentrate effort and action. He can further assist the state inspector by either accompanying him personally on inspections or detailing some one for that purpose. The advantage of having a witness in connection with the taking up of samples is of great value in cases which have to be referred to the district attorneys for prosecution.

(2) The health officer may often be able to cooperate with the state laboratory by correspondence alone. Questions may arise concerning which the local officer may be in doubt. These may refer to the matter of guaranties, to labels, to the sanitation act, or to matters of food and nutrition in general. Much good has been accomplished by such correspondence in the past, but it would appear that if the health officers should take more advantage of the laboratory greater benefit would result.

The health officer should be perfectly familiar with the food and drug law, the amendments, and the food inspection decisions and rules and regulations as issued by the United States Department of Agriculture. He is, however, not always in a position to obtain the latest information with reference to these matters. The state laboratory will cordially respond to all requests for data along these lines. Its aim is to publish all the late food inspection decisions, notices of judgments, and matters of importance, as issued by the United States Department of Agriculture, bureau of chemistry, in the California State Board of Health Monthly Bulletin. It is supposed that every health officer in California is on the mailing list to receive this bulletin. He may not give as much attention to the pages devoted to the bureau of food and drugs as he might, but even after carefully perusing all such data, certain points may not be quite clear. Further information will be cheerfully given upon request to the state laboratory.

Again, questions may arise concerning the labeling of food and drugs, which cannot be answered by the health officer without further advice from the State Board of Health. Such advice can always be obtained by correspondence.

(3) If the health officer is fully acquainted with the laws, rules, and regulations for the enforcement of the food and drugs act, he can, by acting as an unofficial inspector, be of great assistance to the state laboratory. In the future, the guaranty legend—"Guaranteed by (name of guarantor) under the Food and Drugs Act, June 30, 1906"—and the serial number, will not be allowed on packages. A new form of guaranty will have to be used by the wholesaler and dealer. The

form of guaranty suggested by the government, appears in the California Bulletin issued July, 1914. A great many of the retail dealers in the smaller stores are in doubt concerning this matter. If the health officer is fully informed on this subject, he can, by visiting the different stores in his district, assist the retailer in the matter of procuring from the wholesaler a guaranty which will afford him protection.

There are still on the market, unfortunately, many consignments of extracts improperly labeled. Among such infringements is the case of the manufacturer who makes an extract below standard without indicating on the label the nature of the dilution, merely labeling his extract "dilute." The board of food and drug inspection, bureau of chemistry, has ruled that such labeling is not correct—the percentage of dilution or the standards should be on the label. For example, if a lemon extract contains only 2.5 per cent of lemon oil, it should be labeled "one half standard" or fifty per cent of the standard. Similarly with reference to other extracts.

Another product which should be eliminated from the market unless properly labeled is that of so-called egg substitutes. There is a considerable amount of this material on the market improperly labeled. If any material is to be sold as an egg substitute, it should contain the amount of nutriment corresponding to that found in the egg, and not consist of ingredients ordinarily found in baking powder. A baking powder is one thing—an egg is another. An egg is a valuable food—a baking powder is not.

It is true that the health officer could not take up official samples. He could, however, draw the attention of the state laboratory to any alleged evidences of violation of the law, and the inspector would be detailed to confer with the health officer in regard to the matter complained of. In that way very satisfactory results could be obtained in a minimum amount of time. Such cooperation would also effectively better the sanitary conditions of restaurants, eating houses, etc.

Further illustration of the value of such cooperation is in the matter of ascertaining whether or not the rules and regulations of the cold storage act are being carried out.

(4) One of the salient features of the pure food movement is the educational side. It is not the object of the State Board of Health, or those connected with the enforcement of the pure food law, to pounce upon an ignorant infringer of the law and haul him up for disgrace and punishment. On the contrary, the State Board has assumed the attitude of instructor, and it has been very encouraging to find how anxious and willing the great majority have been to understand and comply with the law.

The manufacturers and dealers, however, are not the only class that require education. A great deal of persistent effort is needed in order to make the average consumer both intelligent and conscientious on this subject.

We all have heard the complaints from the grocer that the housekeeper now returns to him his pure maple syrup with the remark, "It is not nice; the family do not like it." She wants the kind of maple syrup she has always used—he offers her the choice of "cane and maple syrup" or "cane and corn syrup maple flavored." Oh, no! She will not have those; she never used "corn syrup," she used "maple," but it was nicer than that which he gave her the other day; she thinks she will try another grocer, and so it goes.

The law of supply and demand is a fixed one—we can not hope to move it. We must, therefore, in trying to regulate the supply, work also to create and maintain the proper kind of demand.

It would appear, therefore, that still more time and effort should be used for educational purposes than has already been done, because successful and satisfactory enforcement is far more a matter of education than of law. In this connection it may be interesting to state that the director of the laboratory has spent considerable time lecturing before different associations and meetings, with special reference to the educational policy of the State Board of Health. The lectures are illustrated by lantern slides.

It is impossible, however, for the State Board of Health, or its officers, to reach all parts of the State and give the necessary instruction to those particularly interested therein. It is here where the health officer can be of the greatest help to the State Board of Health. He can appear before women's clubs, if already organized, or if not, he can help to start such a club in his locality. The interest aroused by such meetings and talks is far-reaching, and more effective good can be accomplished by such educational work than by prosecution.

Dr. F. Reeve Woolsey, Albany: This question is a very important one and I do not think it is open to any great discussion. My main point is that we should all visit the laboratory and learn for ourselves and then we would be in a better position to do for ourselves.

Dr. Wm. Simpson, Santa Clara County: Is there such a thing as a drug inspector in our district?

Professor Jaffa: There is no food or drug inspector assigned to any one district.

Dr. F. W. Browning, Hayward: I think that when the food inspector comes into the community he should at once get in touch with the health officer of the district.

Dr. L. M. Powers, Los Angeles: In Los Angeles, and I presume in other towns, most of our ice cream is made from homogenized milk with a machine called a homogenizer. We have been trying to bring suit against these people and have asked the city attorney and the State Board of Health's attorney and they say it is a violation of the law. There are five or six machines being used in our town.

CENTRALIZATION OF PUBLIC HEALTH ADMINISTRATION.

CHAIRMAN: Mr. Greene, city attorney of Antioch, will read a paper written by Dr. John Force of Berkeley on the "Centralization of Public Health Administration."

Mr. Greene, Antioch: An efficient public health administration is beyond the financial reach of the small rural or suburban community. Berkeley, for example, conducts a fairly efficient control of its milk supply, yet can not afford to inspect, at the time of slaughter, all cattle intended for the meat supply of its inhabitants. On the other hand, Oakland conducts a meat inspection in Emeryville but has no authority to destroy meat condemned in the course of this inspection. Some of the large dairies supplying milk to the metropolitan district around San

Francisco bay are inspected at least monthly by the medical milk commissions of San Francisco and Alameda counties. In addition they are visited by the regular milk inspectors of the bay cities, to say nothing of the occasional visits of the inspector for the state dairy bureau. In contrast to this prodigality of inspection, the small town with no organized milk inspection must depend on three agencies for even a partial survey of its milk conditions. If informed of contagious disease among the cattle, the state veterinarian's office may conduct an investigation. The state dairy bureau is attempting to cover the entire State with a very inadequate force of inspectors principally concerned in keeping up certain standards of milk purity and not concerned with either human or animal diseases in relation to milk products. Finally the local health officer would probably inspect a dairy for a possible typhoid or diphtheria carrier if these diseases should chance to occur along the milk route supplied from that dairy.

The obvious remedy for these conditions is centralized administrative control similar to that provided by law for water districts. Mere similarity of ordinances and friendly reciprocity between municipalities will not secure the desired result.

An interesting experiment in cooperative public health administration has just been published by E. B. Phelps, professor of chemistry in the United States public health service.*

Professor Phelps entered into a contract to furnish a complete public health administration to a group of towns in the neighborhood of Boston, comprising a combined population of 32,650 scattered over an area of 100 square miles. He also contracted to furnish a complete milk inspection service to an additional population of 30,000. The organization consisted of the health officer, a bacteriologist, a field assistant who collected samples for the bacteriologist, a sanitary inspector and two clerks. The total cost of the above service for one year including salaries, laboratory equipment, office furniture and printing, as well as the cost and upkeep of a small automobile and a motorcycle amounted to $7,603.51. From an analysis of costs Professor Phelps has determined that the ideal administrative group would be a population of 60,000 which he claims could be served at an expense of twenty-one cents per capita. This would include the above mentioned employees besides the services of two women health visitors and such extra assistants as might be necessary.

The experiment is interesting as a study of efficiency, but the idea of delegating a govermental function to a private organization is distinctly antisocial and can not be commended. The lesson to be drawn from this experiment is that high grade public health administration is economically possible in a sanitary district which employs a well trained force of workers.

The following plan is suggested for bringing the entire State of California under a centralized form of public health administration without affecting the rights of political subdivisions:

The State Board of Health: The state board should consist of the commissioner of health, a sanitary engineer, a licensed veterinarian and four other persons, three of whom should be licensed physicians. The members of the board should be appointed by the governor for a term of four years with due provision to avoid an entire change of the membership at one time.

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*Phelps, E. B. Cooperative Public Health Administration. Public Health Reports, Vol. 29, No. 39, p. 2477, Sept. 25, 1914.

The Commissioner of Health shall be a civil executive officer appointed to such office by the governor. He shall give evidence of experience in public health administration. He shall serve as president of the state board and as its executive officer. He shall devote his entire time to the duties of his office and is expressly forbidden to engage in any other occupation or business.

Powers and Duties of the State Board of Health:

1. The board should have general power of inspection with power to appoint inspectors, directors of bureaus and other employees subject to state civil service regulations.
2. The board should have power to make rules and regulations for the execution of the duties prescribed by law, including regulations for the guidance of local health officers.
3. The collection and publication of vital statistics and other matters of information concerning the public health shall be a duty of the state board.
4. The board should maintain a system of laboratories for chemical and bacteriological examinations including the examination of milk.
5. It should be made a duty of the board to exercise control of the sanitation of all places where milk and other food products are produced and sold. This would add to the board the functions of the existing state dairy bureau which would be wonderfully strengthened by the change.
6. The board should exercise sanitary control over all public buildings which are the property of the State; over all factories, camps and tenements.
7. It should be the duty of the board to investigate epidemics of contagious diseases among animals. This would add to the board the functions of the state veterinarian and assist in the solution of the problem of rabies, squirrel plague and bovine tuberculosis with which the State is confronted.
8. The board should conduct investigations of the infectious and occupational diseases of man and take necessary measures for their prevention and control.
9. The board should have power to investigate water pollution and sewage disposal throughout the State and take necessary measures to prevent injury to the public health by water pollution or the improper disposal of sewage.

It is obvious that many elements of the above powers and duties can only be administered by the board through a sufficient number of employees. It is therefore important to secure for the board the services of full-time local health officers. The present custom of appointing a local physician at a nominal salary, without any definite understanding as to his qualifications or the amount of time to be given to his duties, is unbusinesslike, to say the least. Furthermore, the health officer with a private practice is open to the jealousy of other physicians in the community.

The County Health Officer: The county health officer should be appointed by the supervisors from a list of eligibles certified by the stat civil service commission. The requirements for health officer should be indicated by the State Board of Health to the civil service commission. County health officers should be deemed state employees and should be compensated in part by the State as is now the custom for judges. The compensation of each county health officer shall be fixed by law depending on the population served. The portion of the compensation not paid by the State shall be apportioned to the one or more counties concerned, on a basis of population. If one health officer is apportioned to several counties, the supervisors of the several counties concerned should meet, for the purpose of appointing a health officer, in joint session. If the supervisors are unable to agree, the State Board of Health shall make the appointment, or any county is authorized to request the State Board to make a suggestion as to the person to be appointed. County health officers shall be full-time employees and shall not be removed from office except for cause. Provision should be made for increased compensation with increase in time of service. Promotion should be consequent on examination.

Deputy County Health Officers: The requirements for deputy county health officers are the same as those of county health officers. While it is possible that a deputy may be assigned to the service of a sanitary district within a large county, or be in full charge of a small county or city, it is probable that deputy county health officers would be assigned to some special duty for a certain area. Thus a deputy county health officer would serve as director of the branch laboratory maintained by the State Board of Health in a county. Another deputy would be concerned in dairy inspection for the entire county or perhaps be conducting a sanitary inspection of the county schools. While the civil service commission should maintain a separate roster for deputy county health officers, it should be possible for any deputy who has served a sufficient time as such to be admitted to the examination for health officer.

City Health Officer: Any city may surrender its sanitary powers to the county and will then be provided with a deputy county health officer who shall serve as city health officer if the size of the city warrants his full-time employment. Otherwise he may be given the city and a portion of the surrounding country in order to make up a population sufficient to form a practical sanitary district. It is obvious that it would be to the best interests of the city to take advantage of the combined state and county aid in the administration of its public health affairs.

Subordinates: Health visitors, assistants, helpers and clerks shall be furnished in such numbers as needed for the proper administration of the sanitary districts. They shall be appointed by the supervisors on recommendation of the county health officer. They shall be compensated entirely by the county.

Summary: The only efficient system of public health administration consists of a strongly centralized health authority operating at the head of a number of sanitary districts in charge of full-time trained employees appointed through civil service regulations.

Moved by Doctor Currie, seconded by Doctor Simpson, that a committee be appointed to confer with the committee on legislation and report before the adjournment of the conference on this matter, leaving the details of the plan out. Motion lost.

Dr. F. W. Browning, Hayward: I think that it is hardly necessary to refer this matter to a committee at the present time. Mr. Chairman, I wish to present the following resolution:

We, the department of public health of the League of California Municipalities, now in session assembled, hereby endorse the general principles of the plan of organization of the public health work of California, as contained in the paper presented by Marx Greene, of the city attorneys' section, of the League of California Municipalities, and request the endorsement of the general principles of the said plan by the League of California Municipalities.

The above motion was seconded by Dr. George E. Tucker and carried, Dr. Donald H. Currie voting "No."

Dr. William Simpson, Santa Clara County: I move that a committee be appointed from this body to confer with the legislative committee of the League of California Municipalities.

There being no second the motion was lost.

Dr. S. S. Bogle, Sonoma County: I move that a committee of five on legislation be appointed by the chair to confer with the committee on legislation of the League of California Municipalities for the purpose of drawing up a detailed plan of public health work for the State.

Dr. Stanley P. Black, Pasadena: I second the doctor's motion.

Dr. George E. Tucker, Riverside: With the consent of Dr. Bogle and Dr. Black I would like to amend the motion to include in the committee the vice-president and secretary of the State Board of Health, making the committee seven instead of five.

With the consent of Dr. Bogle and Dr. Black this amendment was added to the original motion. The vote being taken this motion was carried unanimously.

Chairman: Doctor Tucker will now present his paper on "Methods of Insuring a Safe Milk Supply."

METHODS OF INSURING A SAFE MILK SUPPLY.

Dr. Geo. E. Tucker, Riverside: In presenting this subject before this conference I can scarcely hope to offer any suggestions or bring to your attention any new methods by which the milk supply of our smaller communities can be made ideal. On the other hand I do wish to relate, more or less in detail, my experience as county health officer for Riverside county during the last six years, and my efforts to bring about the production and marketing of a safe and comparatively clean general milk supply.

At the time this subject was first agitated in our county conditions were with no exception those that have always existed in the communities where inspection was carried on no more frequently than once or occasionally twice a year, by a state dairy inspector.

I remember well my first trip to the dairies of our county in the company of such an inspector. At that time there were about eight dairies, with as many delivery wagons, delivering milk in the city of Riverside twice daily. All the dairymen were attempting to aerate the milk but there was no effort made to cool it. There was but one sterilizing plant, and that was inefficient. All milk counts were running from 1,000,000 to 5,000,000 and the dairy inspector was looked upon as an agent of the State, whose sole purpose was to find fault and return again in from six months to a year and give utterance to the same criticisms. As a result of this periodical inspection the floors of milking stanchions were improved, milk houses were removed from the immediate vicinity of horse stables, but the only notable improvement that I felt was brought about was in equipment. The scoring on methods in most instances would have been zero.

During the first six months of my inspection I visited every dairy sending milk or sweet cream to our city at least once a month, and those dairies in which there was little or no improvement I visited every week or two, with the result that the so-called "impossible" dairyman, before the end of six months, was out of business, and those who wished to continue in the industry and supply just ordinary safe milk, so improved their equipment and methods that I felt that raw milk and raw cream could be used by the consumer with at least a small degree of safety. I found milkers suffering with pulmonary tuberculosis in both its incipient and advanced stages. I found cows in various herds which to all appearances were suffering from tuberculosis and in several instances a tuberculin test done some time later confirmed my suspicions.

It was easy to see that regular systematic inspection under the conditions of small return to the dairyman would soon become irksome, and when a protest was filed with the board of supervisors regarding my activities in this line I knew it was only a question of time until a sufficient number of that body would be influenced to such an extent that this field of service would be discontinued. I was quietly advised to direct my attention at some other industry for a while and to permit the dairymen to recover and become accustomed to the new order of things.

Three or four of the more progressive and prosperous dairymen realized that popular sentiment demanded regular inspection and the production of a wholesome milk supply, and it was suggested by them in conference with myself, that a company be formed for the purpose of building a distributing station with the idea that milk prices could be regulated so that the producer would receive a fair return for his product and the consumer would get a better grade of milk and ultimately at a reduced price.

I should like to present the success of this experiment to you for your consideration at this meeting.

The Riverside Dairy Company was incorporated with $20,000 capital stock, $8,500 of which was paid in by seven dairymen. This capital paid in stock was to draw seven per cent interest, payable semiannually. A sufficient amount of money was borrowed from the bank to buy the property, build the plant and install the machinery. The plant started operating in March, 1911. No stock has been sold since that date and none is held by any one other than a dairyman.

At that time eight dairies were selling milk in the city, as I have before stated, with eight wagons making two deliveries a day, and practically every block within one mile square was covered by each of the eight wagons in the early morning and in the evening.

In July, 1910, milk retailed at eight and one third cents per quart. In November, 1910, the price was raised to ten cents per quart. A series of tests showed the butter fat content to vary from three to four and one half per cent, depending to a certain extent upon the convenience of the water supply.

After the formation of the dairy company the price was immediately reduced, and reductions have continued until at the present time milk containing 4.2 per cent butter fat is sold at fifteen quarts for a dollar, or at six and two thirds cents per quart.

There are now fifteen dairies supplying sweet milk, representing about three hundred and fifty cows. With the cooperation of the dairymen interested in this dairy company and following their example, nine hundred and sixty-four cows were tested in Riverside county, eight hundred and forty-seven of which were found to be healthy and one hundred and seventeen reactors. Proper disposition was made of about fifty per cent of the reactors and the other fifty per cent are probably doing service in our own or nearby counties.

Up to the time of the formation of this company, dairymen were satisfied to remain in the business for a very small profit on their product and the profit which resulted from the sale of fertilizer. At that time there was a marked decrease in the number of men engaged in the dairy business, which continued for more than one year. A great many herds were removed from Riverside county to Imperial valley. The market for sour cream was uncertain and there was no incentive for any rancher to feed a dairy herd.

Since 1912 I believe that the number of dairies in our county has doubled until today there are thirty dairies within the city limits of Riverside and forty-five in the county, sending their output to this dairy station. Sour cream comes from a distance in some instances of ninety to one hundred miles, from the Coachella valley, and the outlet for dairy supplies has increased to such an extent that in the summer time and at the present time four hundred pints of sweet milk are sold daily at four cents a pint. In winter eight hundred pints at four cents a pint.

At the present time five hundred and ten quarts are sold at six and two thirds cents per quart and in winter one thousand quarts are delivered. Thirteen quarts of sweet cream, containing twenty-five per cent butter fat, retailed at fifty cents a quart; seven pints at twenty-five cents a pint, twenty-seven half pints at fifteen cents and eleven quarter pints at ten cents.

All of this milk and cream is pasteurized by an unusual method, which is inadequate, of being subjected to a temperature of from 150 to 160 degrees for ten minutes. The dairy is selling nine hundred and twenty-two gallons of milk per day which is known as "special milk," and is produced and handled in a way that approaches certified methods. This milk is not pasteurized and is sold at ten cents per quart and six cents per pint.

Late in 1913 the dairy company submitted three samples of milk to the city laboratory of Los Angeles for count and received a communication from the bacteriologist that the pasteurized milk contained 5,000 bacteria per cc., "special milk" 6,000 and the sample of certified milk 10,000.

The special milk is sold in quantities to the Glenwood Mission Inn and to our other hotels and cafeterias. Skimmed milk is sold at ten cents a gallon. One hundred gallons are consumed daily by people living in the so-called "poor districts" who go to the dairy plant to purchase this product.

Whole milk in gallon lots is sold at twenty cents per gallon. Twenty-five per cent cream is wholesaled in summer time at one dollar a gallon. This is used for making icecream.

All milk is aerated and cooled at the dairies, delivered immediately to the central plant where it is pasteurized, bottled, reduced to a temperature of between thirty and forty degrees Fahrenheit in the precooling plant and delivered to the customer.

For the purpose of delivery but three wagons are used for the retail trade, whereas formerly the same amount of milk from the same number of dairies would have required fifteen wagons.

The total investment in this distributing station at the present time represents in real estate, buildings, machinery and improvements, about $31,000. The total receipts for the month of June for all dairy products amount to $6,453. Monthly expenses as charged to the milk and cream account amounted to about $1,600. There was paid up capital stock of $8,500 by the stockholders. There is a floating indebtedness of $11,000 drawing six per cent interest, and accumulated assets of $9,500.

During the winter months of 1913 and 1914 the producer received as high as sixty-two and one half cents per pound butter fat for sweet milk and fifty cents per pound butter fat for sweet cream. At the present time the milk price for butter fat is at its low ebb and the producer is receiving forty-five cents per pound butter fat for milk or about sixteen and one half cents per gallon for four per cent milk, and thirty-five cents per pound butter fat for sweet cream.

In June there were 6,804 pounds butter fat delivered in milk and cream and after all overhead expenses were deducted from the amount of money received in that month it was found that there was a surplus of $3,350 to be divided on the amount of butter fat above mentioned which would have allowed the producer forty-nine and four tenths cents per pound butter fat. The dairy company paid forty-five cents and credited surplus with four and four tenths cents per pound butter fat.

Three dairymen are employed to manage the business at a sufficient salary to justify them in accepting such employment and discontinuing active dairy work. Sweet milk and cream are sold not only in the city of Riverside but in the adjoining towns of Colton, San Bernardino, Corona, Hemet, Elsinore and Temecula. During the summer months one thousand gallons of ice cream are manufactured monthly, which cream contains not less than twelve to fifteen per cent butter fat, and is sold at eighty-five cents per gallon f.o.b. Riverside. About one ton of butter is handled daily during the winter, of which five hundred pounds are manufactured in the plant and fifteen hundred pounds in Imperial valley, but distributed through this station.

I visited the dairy station on Thursday of last week and by the Babcock test retail milk ran five per cent butter fat and wholesale milk three and eight tenths per cent.

There are at the present time ten employees; the three dairymen above mentioned, three men for delivery and three men who operate the plant and one bookkeeper.

The advantage of this method of handling the city milk supply is apparent. If at any time it is found on inspection that any of the contributors to this station are producing milk under conditions which are not satisfactory, a notice to the producer from the plant is sufficient to prevent the sale of this milk.

The fact that our general milk supply is pasteurized does not in any way deter either the dairyman or the inspectors from insisting upon the production of clean milk.

The establishment of a certified dairy in November, 1911, with thirteen cows, was a further stimulus to the dairymen in the city and county to produce better and cleaner milk.

The certified dairy has increased in size until at the present time about seventeen or eighteen cows are being milked, about one hundred quarts are being sold daily at eleven and one ninth cents per quart and about two hundred pints at the rate of seven cents per pint. The certified dairy has its own delivery and supplies about one hundred customers in addition to two railroad companies. Actual income about $600 per month.

I believe the result of the central dairy plant experiment has shown that the dairy business has been fostered and very greatly increased, that the dairymen receive much more for their products, the customer receives a higher grade of milk at a much less cost and two thirds of the vexatious problems in the control of a community milk supply have been solved by the introduction of this plan.

Discussion.

DR. S. S. BOGLE, Sonoma County: I think the State Board of Health should formulate the regulations for all dairies, the rules governing the care of cows, the care of the milk and the care of the cans. If that was done we would have uniform regulations; as it is, we have as many rules and regulations as we have health officers. If the State Board of Health would adopt uniform rules governing these things and then have the local health officers carry out these rules, the question of securing a pure milk supply would be much simpler.

DR. DONALD H. CURRIE: When I first took office I was going to have a safe milk supply throughout the State. I took the matter up with our attorney and he informed me that if there were no specific laws on the subject our general laws would be sufficient, but as long as the legislature saw fit to place this subject in the hands of the dairy bureau, I could do nothing.

DR. S. S. BOGLE, Sonoma County: I would suggest that the State Board of Health formulate these rules and send them to the boards of supervisors asking that they adopt them.

DR. SIMPSON, Santa Clara County: I have always felt in our county that the cities being supplied with milk are the cities to be satisfied with the milk they receive. If the city demands a high count then the supply must be brought up.

DR. L. R. WILSON, Fresno County: There are difficulties in having uniform regulations for milk supplies. The same regulations which will be all right in the cool counties will not suit the warmer ones, like Fresno. You would have to consider the temperature of the county in making regulations.

CHAIRMAN: We will now listen to Dr. Williamson's paper on "The Relation of Water Supply and Disease."

THE RELATION OF WATER SUPPLY AND DISEASE.

DR. NORMAN E. WILLIAMSON, Sacramento: The quality of water furnished to the public is of great importance to the welfare of the community both from the standpoint of dietetics and disease. It is a problem usually to be solved but once for a community. Good water is costly but the price is amply repaid in satisfaction and in health.

Water should be attractive. It should be clear; free from disagreeable odor or taste and above suspicion as a vehicle of disease. It is very necessary that sufficient water should be taken. The amount, including that in food, averages from twenty-four to twenty-eight hundred cc. daily. Clearness of water and assurance of purity encourages its free use. Proper function of organs and elimination of poisons may depend largely on the consumption of sufficient water. Some obscure conditions of faulty metabolism may be due to lack of water.

From a hygienic standpoint we classify water as good, polluted or infected. A polluted water is one which contains animal or vegetable organic material. A polluted water may not cause disease but it is always dangerous as pathogenic organisms may at any time appear.

An infected water is one which contains pathogenic organisms. Often we are unable to prove this by bacteriological examinations alone. It is almost impossible to find typhoid bacillus in water.

The vibrio of cholera is quite readily isolated from water. As a rule we must rely largely on clinical experience, occasionally on sanitary survey, to prove infection of water. Clinical experience is after all a final test.

I recall the report of a budding bacteriologist who stated that he had isolated the cholera vibrio from a distilled water storage tank for the supply of a large hospital. Had he noted that there were no cases of cholera in the hospital at the time, he would have been saved from an embarrassing situation.

Mineral poisoning by water is not a very common occurrence because the dangers are well known and avoided. Most important of diseases caused by such agents in the past is lead poisoning. Today we are most interested in the transmission by water of typhoid, cholera, dysentery, diarrhoea, intestinal parasites, and, under certain unknown conditions, goitre.

Neither typhoid, cholera, nor dysentery organisms multiply to any great extent in water. The number of typhoid epidemics proven to be due to water is very large. Water is generally taken in the raw state. The closer the source of infection the greater the danger. A great number of cases may originate from a single source of infection. In Butler, Plymouth, New Haven, Nanticoke and Redding there were a total of 3,929 cases with 361 deaths, which were proven to have originated from the careless disposal of the discharges of five cases. Wells are usually infected from the surface; deep wells being generally safe except when in limestone formation. Here the water follows channels and does not receive proper filtration. Leaching pools and broken sewers have infected wells. The great lakes are infected by the sewage of cities which draw their supply from the same source. Steamships also infect water courses. The danger of having several unprotected water sheds as the source of supply was shown at Ithaca, where some time was required to determine the source of infection. Storage of water for a month makes it practically safe but there is always danger of short circuiting polluted material through the storage reservoir. Railway trains may infect water sheds. This danger is gravest when railway tunnels are used as the source of supply. Cities with good water supplies have had epidemics as the result of emergency use of infected water without proper notification of the inhabitants.

Our water courses are the natural sewers and are used for the source of water supplies in many places.. Typhoid germs may live at least five days in water, and the city of Sacramento, for instance, would be subject to infection from the entire American river water shed and a large share of the Sacramento water shed. The current of the American river is from seven to twelve miles an hour; of the Sacramento two and one quarter miles an hour. At this rate water would reach us from two hundred and seventy miles up the Sacramento river within five days and from much farther on the more rapid tributaries.

While typhoid organisms do not multiply they lose very little in virulence or numbers in cold water. In warm water they are more rapidly destroyed by the growth of other organisms. For this reason, practically all of the great water-borne typhoid epidemics have been when the water was cold, in late fall, winter or early spring.

The relation between flood stages of rivers and typhoid rates has been subject to much study with conflicting results. There are probably several factors entering into such relation. Greater speed to flow brings the infection in a shorter time. Sources of pollution previously cut off by dry areas are rapidly brought into the river. Flood waters are usually colder. The dilution is enormous during flood, but the greater virulence and shorter interval of time may be factors of much greater importance.

Objection is sometimes made to the water supply as source of infection that every one who is drinking the water does not get typhoid. Aside from the question of immunity, the occasional bacillus in normal gastric juice would be promptly destroyed, but when the conditions of the individual are suitable and the seed is sown, a case or a carrier would result.

I have prepared a chart showing the typhoid death rate of cases known to have originated in Sacramento from 1895 to July, 1914, as compared with the flood water, rain fall curve, and low water curve of the Sacramento river. The death rate, of course, is based on the deaths per 100,000 population.

In general the seasonal typhoid curve follows the flood water curve of the Sacramento river for the years from 1899 to 1913. There is a sharp break in 1913. The typhoid rate goes down and the flood water up. No cause is assigned for this for it may be possible that more people are boiling or filtrating the water than formerly.

A curve of the death rate by months from 1895 to date shows the greatest height when the water is cold. October, November, December and January are very high. This is a charactertistic curve of waterborne typhoid. Cities having such a curve have had it changed to the summer rise of residual typhoid by attention to the water supply.

In view of the large area of our water shed, it is hardly necessary to search for the point of infection of the river for with such a large population above us, carriers or cases must always be present. Our convalescents go to the mountains and infect our supply. A vicious circle is thus established.

We have photographs of a number of privies situated directly over a creek whose water at that time would reach the Sacramento intake in eighteen hours.

Only three times in six years has Dr. Loizeaux failed to find colon bacillus in the city water. Recently Dr. Sawyer has confirmed this finding.

Now, as to the distribution of cases, we have a spot map of forty-nine cases originating in Sacramento during the months of June and July. Forty-four of these cases are in the area which is supplied by the river water. No two cases are in the same house in two months. It is characteristic of a milk infection for instance, where the dose of infection would be large and partaken of by several members of a family at once, that a number of cases are liable to occur in the same house at the same time. It would be rare with a water-borne source of infection to have two individuals in the same house infected at the same time.

A study of our milk supplies shows that the milk used by the typhoid patients has been in proportion to the amount of milk supplied by any dairy and no suspicion during this year could be attached to this source.

From January to July 15th there were 138 cases of typhoid originating in Sacramento. Of these 93 were reported to have used raw city water and 23 some method of home filtration. I issued a warning at that time calling attention to the number of cases occurring where filtered water was used, stating that the filters should be regularly boiled and that it was safest to boil the water after filtration.

Of course it is not claimed that all the cases originating in a city with infected water are directly due to that water. Other methods of infection must be considered but the chance of infection in other ways is increased by the presence of the typhoid bacillus in water. Cities having infected supplies have had their typhoid rate diminished seventy per cent on the average by installing pure water.

The gross death rate from typhoid varies very little by five-year periods from 1891 to date. The average is 53.5. The death rate from 1906 to 1910 was 59.95 and from 1911 to 1913, 48.2. The highest rate was 1898, 92.96. Other high years were 1901, 87.48; 1906, 80.0. This rate includes a large number of imported cases. The average rate for cases known to have originated in Sacramento for the period 1906 to 1910 is 22.6, the highest being in 1906, 41.5, the lowest being 4.47 in 1910. The average of known local cases from 1911 to 1913 is 18.8 with a local rate of 19.07 for the year 1913. For the sake of comparison the average gross rate of all cities in the United States having a population of over 100,000 for 1913 was 12.7.

The total deaths from 1891 to July, 1914, were 482, of which 354 were males and 128 females, a ratio of 2.76 to one. Of cases originating in Sacramento there were 119 males and 79 females, a ratio of 1.5 to one; of cases from outside the city there were 235 males and 49 females as would naturally be expected. The age incidence shows 14 under five years; 19, 5 to 10; 72, 10 to 20; 157, 20 to 30; 109, 30 to 40; 45, 40 to 50; 35, 50 to 60; 20, 60 to 70 and 8, 70 to 80, with three whose age was not determined.

The number of Japanese was 125. For one year, when based on the Asiatic population of this city, I found the death rate of Japanese to be 290 per 100,000 but, as it happened, all of these cases came from outside of the city. A very large proportion of the Japanese deaths were non-residents.

We had very little trouble with typhoid in Panama, or in fact, any water-borne diseases. Certain water sheds were set apart and depopulated. Reservoirs were made and the water repeatedly examined. Distilled water was furnished for drinking purposes until the water supply of any district was free from danger. In the Gorgona district distilled water was piped over quite an area. A large proportion of the laborers used raw water. At one time the body of a man was brought into Gorgona whom I found to have died of typhoid on post mortem examination. Indians brought him in following a trail through our water shed. With one of the Indians as a guide, Sanitary Inspector Mitchell and I went through the jungles to find where he had been living. We found that it was on the bank of a small stream, occasionally and as it happened at that time, used as a source of water supply when the reservoir was low. It was an intensely hot day, perfectly still, very humid and with a very hot sun. We had traveled across two sharp ridges and over a rough jungle trail. I was never so thirsty in my life as on that return trip. We crossed repeatedly that little creek of clear water, musically rippling over its bed, sometimes wading in it for quite a distance and finally were compelled to finish the journey on a dead run to get a drink of water.

Of course pumping from this stream was stopped at once and no harm resulted.

We had a few cases of typhoid in my district of laborers in Cut No. 3, across the river and a little below Gorgona shops, who drank river water. The sewage of Gorgona shops entered into the river and a case of typhoid had been sent from the shops to the hospital a short time previously.

The association of cholera with water supply is also very close. The famous cases of the Broad Street well and the Hamburg epidemic are too well known to need further comment. The sacred rivers of India which are used for bathing and drinking are constant sources of infection.

In 1880, in Manila, the Passig River was a sewer and the source of water supply for a large share of the inhabitants. In the cholera epidemic at that time, I have been told by people who were there, that there were as many as 1,000 cases a day.

I was in Manila before and during the epidemic which started March 20, 1902. During this epidemic I believe that 100 cases was the greatest number reported for any one day. Our water supply came from an inhabited water shed which was practically unprotected. Guards were put on all the street faucets and distilled water in carts stationed at street crossings for drinking purposes. Regular daily examinations were made of the water supply. Cultures with Dunham's peptone solution often showed vibrios which required considerable study to separate from the vibrio of cholera, but no cholera organisms were found. They were isolated, however, from water jars in private houses and from water underneath the houses where cholera was prevalent.

Cultures of Manila water at that time developed a pellicle in 24 to 48 hours very rich in amebæ and balantidium minutum. Amebic dysentery was very prevalent in Manila at that time. Musgrave and Clegg cultivated entameba histolytica later from this water. Bacillary dysentery is undoubtedly conveyed by water. Japan has had a few epidemics shown to have been caused by infection of water. No epidemic in the United States has been proven to have originated from the water supply.

Diarrhœa, especially in children, has been attributed to polluted water supplies. The colon bacillus itself may be the cause of infection.

Many of the soldiers found infected with intestinal parasites gave a history of having drunk water from pools and streams. At one time it was thought that uncinariasis was commonly acquired in this manner. Now we believe that infection through the skin is the most important factor.

Among other parasites obtained from water are ascaris lumbroides, trichuris trichura, oxyuris vermicularis, rhabdenoma strongiloides, and schistosomum hæmatobium. Uncinaria, ascaris and trichuris are often found together in examination of stools of natives both in Panama and Manila. In Manila rhabdenoma strongiloides is very rare. I saw only one case in a white man, who had been drinking from pools. In Panama it is very common.

Relationship between goitre and certain water supplies has been suspected in several localities. This relation is best shown by the incidence of goitre in Vienna after the introduction of water from the Kaiserbrunnen. This water is of exceptional purity, bacteriologically and chemically, and the reason for this relationship to goitre can not be determined.

The subject of the relationship of water to disease is incomplete without consideration of the Mills-Reincke phenomenon. These observers noted that the lowering of the general death rate following the introduction of pure water in a city having a polluted water supply was much greater than could be accounted for by all known waterborne diseases. This experience has been borne out in the history of a number of cities. It is in line with the general observation that public health work directed against a particular disease brings rewards in apparently unrelated ways.

Discussion.

PROF. CHARLES GILMAN HYDE, Consulting Engineer, State Board of Health: It is refreshing to listen to a paper of such excellence as that which Dr. Williamson has just read. I am delighted to have the privilege of discussing it. Dr. Williamson is to be congratulated upon the fact that his presentation, while technically sound, has been very clear and understandable, so that even a layman may appreciate the significance of the discussion.

Human experience with our so-called "water-borne" diseases has been truly appalling. The lives which have been sacrificed to these diseases in the past have been almost as the sands of the sea, without number.

It is apparent that the diseases which may normally be conveyed by water and therefore which may be designated as typically water-borne, must be diseases of the alimentary canal. Beyond peradventure infected water supplies are too largely responsible for the sickness from cholera, typhoid fever and dysentery, both bacillary and amebic, which prevails and probably always has prevailed among human beings. In addition to these specific diseases of the digestive tract it appears that infected water supplies may be concerned with the occurrence of other diseases, perhaps even those of the respiratory tract. At any rate, the studies which have been made by Mills, Reincke, Hazen, Sedgwick and McNutt (1) would seem to indicate that, where safe water supplies have replaced grossly polluted ones, the general death rate has been reduced to an extent far greater than can by any possibility be accounted for by the reduced mortality from the typical water-borne diseases. Studies by Sedgwick and McNutt indicate that in such cases important reductions may obtain in the prevalence and mortality from certain diseases of the respiratory tract, namely, in pulmonary tuberculosis, pneumonia and bronchitis. Moreover, the reductions in deaths from diseases which contribute to infant mortality are so important that it may properly be concluded that these diseases are thus greatly reduced in prevalence or virulence, or both. The possible relation of water supplies to the dissemination of anthrax and dracontiasis has long been recognized but the importance of these diseases up to the present time has been negligible.

Typhoid fever is, of course, the most typical as it is the most awful water-borne disease in the United States at the present time. Cholera has not been a factor in this country since about 1873.

McLaughlin (2) in 1912 estimated that in 1910 at least 25,000 deaths from typhoid fever occurred in the United States. Others have estimated that the total number of deaths from this disease in the United States in that year was as great as 35,000. We can never know what the true death rate from this or any other disease was at that time because no vital statistics were available for a considerable proportion of the population. For our present purpose we may assume that 30,000 deaths from typhoid fever occurred in 1910 in a population of approximately 92,000,000 persons.

The fatality of the disease is also unknown since very many cases of typhoid fever are not reported even in the registration area. Many cases are not recognized and are reported as some other disease. Still other cases occur in so mild a form that they do not come under the observation of a physician. From such general vital statistics as are available in America it would appear that the fatality from typhoid fever varies from eight to fifteen per cent, averaging perhaps ten per cent. As a matter of fact careful field investigations of typhoid fever epidemics indicate that the true fatality is perhaps only between two and five per cent. Hospital statistics naturally give a high rate of fatality due to the fact that only severe cases reach the hospitals. For present purposes we may assume a fatality for this disease of five per cent. From statistics developed by Fisher (3) it would appear that the median age of the people living in the United States in 1910 was approximately forty-five years. If we may assume that the rate of prevalence and mortality from typhoid fever obtaining during 1910 should continue to prevail throughout a period of forty-five years among this group of 92,000,000 persons, it will be seen that there would result the astonishing record of one death from typhoid fever among every sixty-eight persons in this group and one case among every 3.4 persons.

It is generally known that typhoid fever prevails to the greatest extent among adults who have arrived at the period of their maximum efficiency and therefore their greatest earning capacity. It has been estimated by Leighton (4) that the money value of each life sacrified to typhoid fever may properly be taken at $4,600. Considering such features as loss of wages, cost of medical attendance and nursing, cost of medicine, etc., and assuming that twenty cases of the disease obtain for each death which occurs from typhoid fever it would appear reasonable to assume a total cost of $3,400 for these features, making the total economic loss for each death from typhoid fever equal to $8,000. If 30,000 deaths from typhoid fever occurred in 1910 it would appear that the toll which this one disease exacted of the people of the United States during one year was not less than $240,000,000. This is a truly staggering sum. Whether the figures are correct or not, they certainly demonstrate that a terrific loss is annually sustained by our people due to a disease which, theoretically at least, is entirely preventable and actually is nearly so. This loss must be measured both in terms of money value and of that less tangible but important thing which we call vital assets. But no sordid measure such as dollars and cents can express the suffering which such sickness and death from this disease entail.

It must be remembered that, while water is, for conditions now prevailing in the United States, probably the chief carrier of typhoid fever, this disease is also caused by other agents including milk, contact, flies, shell fish, raw vegetables and fruits, etc. Even if our water supplies should be made perfect a very considerable amount of typhoid fever would probably obtain in this country because of the action of these other carriers of infection. Thus, although the water supplies in Washington and New Orleans have been improved to such a point that they can not longer be considered as possible vehicles of infection, the typhoid fever death rates in these communities are still comparatively high and amount to from twenty-five to thirty persons per hundred thousand.

Typhoid fever, like tuberculosis and many other diseases, is reduced rapidly by an improvement in sanitary conditions. It would be difficult to conceive of larger returns for given investments which any community can reap in any way than by improving its environment as related to water supplies, food supplies, control of contact infections, etc. As just stated, typhoid fever seems to be particularly amenable to control by such measures. When the water and milk supplies are made safe, experience indicates that the danger of contact is steadily diminished until a minimum is reached. McLaughlin (2) has pointed out that, in certain large cities of northern Europe, the death rate from typhoid fever has been reduced to an average of only slightly more than two per hundred thousand. This may be called the present residual rate. In these cities milk and water are no long factors and contact cases have been reduced to extremely low terms.

The state of Massachusetts may be taken as an interesting example of reduced prevalence of typhoid fever due to better sanitary conditions. During the decennial period 1856-1865 the typhoid fever death rate in Massachusetts was about ninety-two per hundred thousand and about seventy-five per cent of the people were not supplied with public water. In the decennial period 1886-1895 the typhoid fever death rate was about thirty-five per hundred thousand and only about twelve per cent of the people were not provided with public water supplies. The public water supplies which were introduced during the interval between these decennial periods were for the most part acceptable to the State Board of Health and were subject to their investigation and control. These public water supplies supplanted the private supplies from wells, a considerable proportion of which was undoubtedly contaminated. In recent years the typhoid fever death rate in Massachusetts has been steadily reduced, the figures for the years 1908-1912 being as follows:

Year	Death rate per hundred thousand
1908	16.5
1909	12.3
1910	12.2
1911	8.8
1912	7.6

It would appear that the state of Massachusetts is reaping a large reward for the work of control of agents of infection of typhoid fever such as water and milk and, more recently, from the consequent diminution of the disease due to contact.

This discussion would not be complete without a brief reference to the development of the art of water purification and the increase in the population supplied with filtered water in the United States during the past few years. Twenty years ago the art of water purification by filtration was in its infancy. Today filtration by rapid sand and slow sand methods have both been developed to conditions of extraordinary efficiency. During the past five years enormous progress has been made in the development of methods of disinfection of water supplies, notably by the use of bleaching powder solutions and liquid chlorine. In Europe some progress has been made in the ozonization of water and in the use of ultra-violet rays for bacterial destruction. On account of their high cost, and low efficiency with improper manipulation, it is not likely that these last-named methods of treatment will become popular in America for a long time to come, if ever.

According to Johnson (5) the development of population supplied with filtered water in the United States has been about as follows:

Population in the United States Supplied With Filtered Water.

Year	Urban population*	Population supplied with filtered water		
		Through slow sand filters	Through rapid sand filters	Total
1870		0	0	0
1880	13,300,000	30,000	0	30,000
1890	21,400,000	35,000	275,000	310,000
1900	29,500,000	360,000	1,500,000	1,860,000
1910	38,400,000	3,880,000	6,920,000	10,810,000
1920†	48,200,000	7,670,000	19,350,000	27,020,000

*In places of more than 2,500 inhabitants.

†Estimated.

Most important reductions in typhoid fever prevalence and the death rate therefrom have obtained with the introduction of purified water in cities in the United States. The following figures will tend to show something of what may be expected along these lines:

Typhoid Fever in Certain Cities of the United States Before and After Filtration Was Introduced.

	No. of places	Years before filtration	Years after filtration	Typhoid fever per 100.000		
				Before filtration	After filtration	Per cent reduction
In cities whose supplies are purified by slow sand filter plants	7	9	9	81	22	73
In cities whose supplies are purified by rapid sand filter plants	6	9	5	44	16	64

The California legislature of 1913 passed a measure which, if the machinery were provided for carrying it out, would undoubtedly cause a very great improvement in the character of the water supplies in this State. This measure is known as chapter 373 of the statutes of 1913. Unfortunately the State Board of Health has not been provided with any machinery whereby it might be able to carry out the provisions of this act. It is to be greatly hoped that the legislature of 1915 will find it possible to provide generously for this work. The necessary application and data blanks have now been prepared by the State Board of Health and will be available for use as soon as the opportunity is given for the Board to operate under the law. This association of health officers should take it upon itself to do all that it can to mold public opinion and legislative action so that such laws as the one in question may be adequately enforced. Without a shadow of doubt the benefits which may be derived from such control will be so vast, as compared with the expenditure of time and energy involved, that the investment must be considered as not only desirable but absolutely essential to the best interests of the State.

References:

(1) "On the Mills-Reincke Phenomenon," etc., by W. T. Sedgwick and J. S. McNutt. The Journal of Infectious Diseases, Vol. 7, No. 4, August 24, 1910, pp. 489-564.
(2) "Sewage Pollution of Interstate and International Waters," by A. J. McLaughlin, Bulletin No. 83, Hygienic Laboratory, United States Public Health Service, March, 1912.
(3) "Report on National Vitality," by Irving Fisher, Bulletin 30, Committee of One Hundred on National Health, United States Government Printing Office, Washington, D. C., 1909.
(4) "Typhoid Fever," by G. C. Whipple, Wiley & Sons, N. Y., 1908, pp. 273-274.
(5) "Present Day Water Filtration Practice," by G. A. Johnson, Journal of the American Water Works Association, Vol. 1, No. 1, March, 1914.

Dr. W. A. Sawyer: Dr. Williamson has presented most clearly to us the results of his study of the relation of water supply to disease. This subject is very important in California at the present time, as there is much water-borne typhoid fever in our State, not to mention other diseases whose relation to drinking water has not been so well determined. Professor Hyde has just called attention to the Hazen theorem, that, where one death from typhoid fever has been avoided, two or three from other causes have been avoided. The theorem is based on authoritative statistics showing that the benefit from filtration of polluted water supplies is in many instances several times as great as the benefit from the diminution of typhoid fever alone, as indicated by reported deaths. An analysis of the statistics upon which the Hazen theorem rests shows that a considerable part of the improvement in the death rate after water purification consists, as Professor Hyde has pointed out, in a diminution of deaths from pulmonary tuberculosis, bronchitis, pneumonia, and other diseases, which most of us can not regard as water-borne.

To explain these astonishing facts, two possibilities are usually stated: First, these diseases may be water-borne after all; or, second, the drinking of a pure water may increase the general resistance to disease. I believe that these explanations do not hold. Pulmonary tuberculosis is a disease covering in its course usually a number of years, and the elimination of a supposed water-borne infection would not result in a sudden decrease. Neither will the raising of resistance by improvement of the quality of the drinking water account for the diminution in the number of deaths from bronchitis and pneumonia. I believe that the real explanation is that the diagnoses on the death certificates, in many instances, do not show, as primary or secondary causes of death, typhoid fever, a gastro-intestinal infection, or some other disease which may readily be accepted as water-borne. Typhoid fever alone is so varied in its symptoms and complications that it may be reported as bronchitis, pneumonia, malaria, dysentery, to say nothing of the now obsolete "typho-malarial" fever.

From my own experience in investigating typhoid fever epidemics in this State, I can assure you that the majority of typhoid infections are not recognized. If an epidemic is thoroughly investigated, we find the mortality to be from two to four per cent of all discoverable cases. In the absence of an investigation the mortality is apt to be reported as between eight and fourteen per cent. You can readily see that from half to two-thirds of the typhoid cases, to say nothing of other water-borne diseases, are unrecognized and will be a factor in the deaths reported as tuberculosis, pneumonia and bronchitis, and laid justly to impure water. I believe that the Hazen theorem could well be amended to read as follows: "After water purification, for every reduction in the number of reported deaths from typhoid fever, a certain number of other deaths, probably two or three, have been avoided."

I need not point out the responsibility of the health officer as local registrar of vital statistics for the checking and correcting of errors in death certificates.

In whatever way we explain the Hazen theorem, we nevertheless must recognize its great significance. In many of our towns and cities there is no way in which a health administration can make a greater improvement in the death rate than by securing a water supply free from sewage pollution.

Dr. J. J. **Benton**, Berkeley: There is one other thing which I would like to bring to the attention of the conference, and that is the relationship between water from wells and disease. Berkeley receives its water supply from the People's Water Company and the supply of that company has been limited, so that people in Berkeley who use a large amount of water have sunk wells and are using the water from these wells. I think an ordinance should be passed regulating wells in the residence section.

Dr. Williamson: There is a tendency to overestimate the number of diseases which are water-borne. In view of our present understanding in regard to the transmission of tuberculosis and pneumonia, it seems probable that water is not in any way concerned with their transmission. A curve of the deaths of local cases of tuberculosis for Sacramento, from the years 1900 to date, shows a steady decline to .495, which is a very low rate.

In regard to the height of the typhoid curve of this city, it must be remembered that it is probable that many people develop more or less immunity to typhoid and that a very large number use precautions, such as boiling before drinking the water. The curve, while not excessively high, is not low, as was shown by comparison with the gross rate of other cities. It seems probable that if the same supply was suddenly introduced into a city accustomed to having a pure supply the amount of typhoid developed would be very high.

In regard to the Mills-Reincke phenomenon, it is, as is mentioned, undoubtedly true that many cases of water-borne diseases have been wrongly diagnosed and would be a factor of importance, but it also seems probable that the use of an infected water would affect the health of a people on account of the fact that less water would be taken than would be required for each individual, and that a fatal termination may occur in other diseases due to diarrhœa or other infection from the water.

The determination of the relation of colon bacilli to typhoid bacilli in water, in order to use the colon as an indication of a degree of danger, does not seem to me to be feasible. The relative or variability of the two organisms must be determined: the average shed of colon bacilli by a given population, the average shed of typhoid bacilli by a given population, and the minimum infecting dose of typhoid bacilli. The number of typhoid bacilli from any given case or carrier is exceedingly variable. Cases known are cases neutralized if the excreta are properly disinfected. The number of cases and carriers of any community would vary within wide limits.

Direct experimentation to determine the minimum infecting dose of typhoid bacilli can not be done, because it would have to be on human beings. It seems reasonable that a single organism would, under suitable conditions, develop in the intestinal tract just as it can produce a colony in the laboratory and, having multiplied, can produce infection. So many of these factors are variable that the presence of colon bacilli in water must be taken simply as an index of danger.

COMMITTEE ON LEGISLATION.

CHAIRMAN: I wish to announce the appointment of the following as a committee on legislation: Doctors S. S. Bogle, Stanley P. Black, F. W. Browning, George E. Tucker, William Simpson, James H. Parkinson and Donald H. Currie.

There being nothing further to come before the meeting I will declare a recess. The afternoon session will be held jointly with the other sections of the league.

FOURTH SESSION.

Wednesday, October 14, 1914, 2 p.m.

A joint meeting of the entire body was held at 2 p.m., President Percy V. Long presiding.

The following program was presented:

Report of the committee on reform in state government. Members of the committee: Chas. N. Kirkbride, J. J. Gill, C. F. O'Neall, B. D. Marx Greene and C. L. Priesker.

"The Relation of a Health Officer to the Municipal Government."—George E. Tucker, M.D., health officer of Riverside.

"The Value of Experts to a City Government."—Professor Thos. H. Reed, University of California.

"The State's Tax System with a Special Reference to the Bond Feature."—John S. Chambers, state controller.

THE RELATION OF A HEALTH OFFICER TO THE MUNICIPAL GOVERNMENT.

DR. GEORGE E. TUCKER, Riverside: In speaking before this league, I realize the necessity of avoiding a technical discussion of the various problems which confront public health departments. I further realize how intimately and how intricately the protection of the health of individuals who go to make up a community or municipality is interwoven with the various departments of the municipal government.

Community life, with its many vexatious problems, has developed one of interest to every individual living in it, namely, the public health problem. The health and prosperity of the community are dependent upon the health of the people, and a healthy community is prosperous, attracts people and increases the value of property. Public health is purchasable, and within certain limitations a community can determine its own death rate.

Health departments are the direct outcome of the knowledge that disease can be prevented. The general prosperity of the State is dependent upon the general health of the people. Money put into health and sanitation of any character must be regarded as an investment from which definite returns are to be expected, and must not be considered in any sense an unprofitable expenditure.

The public press of the city of Chicago has taken up a campaign for an increase in the allowance to its health department, and investigation has shown that whereas the police department cost $2.86 per capita, and the fire fighting department $1.43, but 30.8 cents per capita had been spent in public health work.

It has been noted that in the Canal Zone, where such wonderful work has been carried on, the death rate for 1911 among 10,489 Americans was only 4.48 per thousand. This record is a remarkable one and is probably without rival. "And all this," says Colonel Gorgas, "has been accomplished at an expense averaging one cent per day for each individual." If this result can be secured at this cost in the center of a tropical jungle, what would not a similar expenditure do for our American cities?

If public health administration in our various states and municipalities has not been as effective as could be reasonably desired, and if the state-wide results in the various parts of the country have from time to time been the subject of unfavorable criticism, part of the blame, at least, should rest upon the shoulders of the disinterested public who have failed to take sufficient interest in public health to demand the conditions which they desire.

This idea has been well expressed by some one from the state of New Jersey, who stated that "in the history of corporations or institutions and in public matters we generally find that administration precedes efficiency, that laws tending to the perfection of an administrative work take precedence over laws tending to the efficient direction of the same; that citizens and the public are more inclined to allow their minds to dwell on generalities than on detail. As a consequence of this psychological fact, boards of health have been appointed as a matter of course, but without due regard to their efficiency. Man is so accustomed to be sick and disabled that through his inability to properly connect cause and effect he has accepted the inevitable without comprehending the reasons for unnecessary illnesses and deaths. Then again, the health board being a road for publicity, politicians and those politically inclined have taken advantage of such position in order that they might use it as the first rung of a ladder for ascent to something more remunerative and more agreeable. Others have employed it as a resting place for easy work and moderate income. Material advances in public health matters have been invariably either through public calamity, a temporary hysteria or excitement brought about by some one calling attention to defects and making demand for improvement, or the slower process of public education and resulting clamor for better conditions. We have in this state, as we have in other states, hundreds of local boards, each governing itself, each mapping out its own policy, and none correlating, so that the unhealthy conditions of one community are not prevented in passing over to another. Disease is not a local condition. Disease processes and dissemination should be considered as a broad matter, demanding at least state control. It is not for us to discuss here government control."

Local boards of health made up of men who are not in a position to know the condition of a city's finances, who are not familiar with the many problems involved in the acquisition and carrying of an adequate water supply, who are not fitted by training to consider engineering difficulties connected with the collecting and disposal of sewage, who know but little of the details of the production, distribution and manner of handling food products, are not qualified to render service to a municipality which can be considered either efficient or economical.

In one of our eastern cities the board of health consisted of a liquor dealer, a grocer, a seller of shirtwaists, a man of leisure, a newspaper humorist, and the one doctor upon whose presence the law insists. And the one doctor, as it happened, was an eye and throat specialist, so his knowledge of and interest in preventive medicine as related to municipalities must have been in inverse ratio to his proficiency along his own line. These selections, absurd and outrageous as they were, were accepted with perfect equanimity by a great majority of the inhabitants of that city.

Not many years ago the health officers and boards of health were appointed for the purpose of handling situations which arose as a result of the introduction and dissemination of contagious diseases. The health officer established quarantine, put up a flag, attended to the details of fumigation and release. The duties of the other members of the board consisted largely in acting as a buffer between the unfortunate citizen who was restricted in his movements by virtue of being a sufferer from a contagious disease and the health officer who did his duty and established such restrictions.

The question as to the necessity of a properly trained physician and an engineer on a board of health is seldom argued. Health boards are concerned with water supplies, sewage disposal, collection and disposal of garbage, street cleaning, tenement house sanitation, etc., and the solution of these problems requires the services of engineers, and it is for this reason that a municipal board of health should have, for at least one of its members, an engineer whose judgment may be accepted as final.

Further representatives on municipal boards of health should be chosen with the idea of selecting individuals who are intensely interested in the very problems which require the services of an engineer, a physician, and a financier to solve. A representation of two successful laymen who are in a position to pass judgment on the expediency of proposed reforms are of invaluable assistance in the conducting of municipal health affairs. Usually the mayor of a city, in touch with the popular chord and the public purse, becomes a most excellent member. In municipalities where public school inspection has become a fixed institution, as a fifth member of the board, the selection of the inspector might be justifiable. Health interests in the hands of five men representing the knowledge which the above mentioned men should have, would be safeguarded, and with the cooperation of an enlightened public, conditions would be approached which would permit of the attainment of the ideal so successfully attained by our own government in the Panama Canal Zone. It would then be realized that public health officials must be full-time officers and, further, they must be adequately paid.

Such an official working in conjunction with such a board, backed by sanitary laws which are practical of administration, would bring about the ideals of preventive medicine.

The objection might be raised that such an organization and plan as I have just outlined might be applicable to large cities, but that smaller communities would never be justified in adopting an elaborate scheme of public health supervision. For a small community, then, the full-time county, or district health officer, working with a local board of health made up of members who are not supporting any fad or faith, would offer a solution to this problem.

Such county or district official should not be made subject to political appointment, but, if possible, should be selected on the basis of civil service and endorsed prior to examination by the State Board of Health.

The district health officer should have jurisdiction over all parts of his district and should have authority exceeding that of the municipal health officer.

The safety of a municipal water supply is often dependent upon the safeguarding of the source against contamination by neighboring municipalities. For its own protection, or selfishly speaking, it is

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seldom necessary for a city to be deeply concerned regarding the proper disposal of its sewage, inasmuch as conduits are installed to carry away such refuse, but a neighboring city may suffer from improper disposal.

Likewise food supplies are derived from sources located in adjoining cities and counties, and the control exercised by one municipality or county, may not be at all comparable to that enforced by its neighbor. Standards for food products are not uniform and there is much useless duplication of effort on the part of health officials. For example, milk produced in dairies in Riverside County under the inspection of Riverside County officials, is shipped to the cities of Los Angeles and San Bernardino, and also to the town of Colton and intervening points between Riverside and Los Angeles. The health authorities of Los Angeles are not satisfied with state inspection, nor are they satisfied with the control exercised by county officials of Riverside County. The city of San Bernardino ignores the state, county and municipal inspections previously mentioned and we find as a result. representatives of four different departments of health exercising their right of protecting their community against a contaminated milk supply.

The same conditions prevail in the meat and vegetable supplies. Vegetables which are eaten raw are produced in many counties of southern California in truck gardens farmed by Chinamen, and any one familiar with the Chinese method of growing vegetables recognizes the necessity of proper inspection and control.

Only the larger abattoirs have government inspectors delegated to safeguard the public against the sale of meat from diseased animals. The greater part of the meat used in our smaller communities is slaughtered within the vicinity of the place of consumption and little or no protection is afforded the consumer.

The control of communicable diseases in any given locality, to a certain extent, is dependent upon the care exercised by health officials in neighboring communities; and with a district health officer there would be less danger of the spreading of contagious diseases from one neighborhood to another.

Health officers are called upon to exercise police powers which are not universally approved and in this free country of ours, any department of the government which is dependent for success upon the restriction of universal freedom, any officer called upon to enforce such restrictions, must of necessity bring about a certain amount of discord and create a few friends not overenthusiastic in their protestations of friendship. In brief, it is possible for a health officer to become unpopular. Were they elective officers, the recall might be easily worked overtime.

The field of public health work is continually broadening until at the present time its relationship to education, the prevention of crime. insanity, blindness and industrial accidents is well established.

If the spread of tuberculosis is dependent upon a low resistance of the people and if the cure of tuberculosis is to a very great extent dependent upon the factors of rest, fresh air and good food, and if it is true, as it seems, that the application of these therapeutic principles assists in bringing about recovery by increasing resistance, why are they not as applicable to healthy persons to maintain health as they are to unhealthy persons to bring about healthy conditions?

If the open air school building can be constructed for one fourth to one half the cost of the so-called closed building, and if the children attending such schools show a fifty per cent increase in efficiency, as statistics indicate they do, and if our tuberculous school children improve under such therapeutic procedure in California, where climatic conditions are favorable, why should we continue to build monuments of brick and mortar for future generations to destroy because of their unfitness from a health standpoint.

The advancements being made in all lines of endeavor at the present time justifies any municipality in placing its various technical questions in the hands of boards who are prepared to act in an advisory way to every other department of the municipal government. It would be interesting to know in how many instances a health board has been consulted by a board of education on the question of the proper construction of school buildings from a public health standpoint.

The plea for outdoor living and outdoor occupations, the campaign for better ventilation in our industries, has been accompanied by the development of our air-tight schoolhouses. The principle of pumping fresh air or withdrawing foul air has been developed to a high degree of efficiency, whereas the principle of exposing individuals to fresh air has been abandoned in school construction, except when applied to open air schools for the tuberculous.

If the untreated or cold fresh air is beneficial to the sick, by what line of reasoning can it be condemned as injurious to the well?

Medical assistants to judges of juvenile courts are found in many states. The work done along lines of corrective operations to overcome incorrigibility and to prevent delinquency has been successfully carried out in Judge Lindsay's department in Denver and Judge Curtis D. Wilbur's department in the city of Los Angeles.

The development of adult criminals is oftentimes the result of preventable pathological conditions which should have been recognized and corrected in early childhood. The role syphilis plays is undoubtedly familiar to all of you.

Here, again, the principles which are applied for corrective purposes for the relief of social delinquents should, if applied early in accordance with the methods now established in public school inspection, relieve juvenile court departments of the major portion of their work.

Only recently one of the members of the present State administration, in publicly discussing the workmen's compensation act, made the statement that a very large number of the criminals of San Quentin and Folsom were sons of parents whose physical and financial conditions had been altered as a result of an industrial accident to the wage earner, resulting in breaking up the family and delinquency of the children.

The result of preventive work, as carried on in Germany and England, I think demonstrates very clearly that a very large per cent of our industrial accidents can be prevented and that physical examination of employees and applicants for employment, or a selection of risks, should accompany the installation of safety devices.

Workingmen with certain types of faulty hearts, with imperfect vision as the result of defective eyesight, or the loss of one eye, with defective hearing, should not as a rule be given employment in the industries where the hazard is multiplied many times as the result of these infirmities.

The municipality has an interest in the welfare of its citizens and its health department, while possibly not assuming direct responsibility for industrial conditions, should at least keep in touch with such situations and have some knowledge of the conditions under which workingmen are employed.

"The late Dr. Charles Harrington, under whose supervision was shown in Boston, Massachusetts, in 1907, for the Massachusetts state board of health, the first exhibit in America relating to occupational diseases, called attention to the fact that the disastrous effects attributed to occupations were in very large part due to non-observance of the principles of general hygiene and chiefly to inattention to that most important sanitary measure, perfect ventilation. He further gave it as his opinion that with proper attention to this matter and improvement in the home and home influences, greater attention to the character and preparation of food, and a more general observance of the beneficial influences of outdoor exercise, no very great difference would be noted in the health of the various classes of working people, and the expression 'occupational diseases' would lose whatever significance it now has."

It has been computed that there are now 110.000 blind persons in the United States. A very considerable portion of this blindness has been brought about through the agency of venereal diseases. In the New York state asylum there are now 20 per cent of the blind there as the result of these diseases.

In the United States army syphilis causes the discharge of more men for physical disability than does tuberculosis. In the United States it has also been calculated that 65 per cent of adult males have had gonorrhea.

In this country 800,000 males reach maturity annually. Of this number 500,000 become infected with this disease. Morroy estimated that 20 per cent become infected before the age of 21 years; 60 per cent before the age of 25 years; and 80 per cent before the age of thirty. There are 14,000,000 male adults under the age of thirty in the United States, and the most reliable observers calculate that 8,000,000 of them have had venereal diseases, or its sequelæ.

Gynecologists report that more than 50 per cent of the abdominal operations in women are for inflammatory conditions due to venereal trouble, through infection.

In France it is estimated that twenty children out of every hundred die yearly of such infections and the total mortality of that disease is 7½ per cent. These statements are in print and obtainable by any one who is interested in this subject.

From time to time, in spite of popular prejudice, the venereal peril receives public consideration. Unfortunately the men who are best fitted to discuss the subject hesitate to give information to an unknowing and unsuspecting public. Information regarding local conditions in any community is acquired only by physicians and usually within the four walls of their offices. A majority of these confessions are obtained in secrecy from suffering victims who know that their secrets will be well guarded. It would not be fitting for medical men to voice their opinions on this subject before a body of men by whom they might be misunderstood. Like the problem of tuberculosis, also the problem of typhoid fever and the problem of smallpox, the solution must be through education. Various educational societies have been formed for the purpose of disseminating information which would help check the prevalance of venereal diseases. Such a society is at present actively engaged in this warfare in California.

A medical inspector of schools might be called upon to lecture upon the subject of venereal diseases before the young men of our schools so that their knowledge of these subjects could be obtained from a reliable source and not from uneducated acquaintances or quack literature.

None of us would presume to attempt to estimate the infinite good that must be brought about as the result of a well planned and effective educational campaign along these lines.

Business men and the public should be brought to understand that upon them rests largely the responsibility of the health of the community. Without their interest, encouragement and willingness to fight for a principle, nothing can be accomplished. No medical men nor health officers can bring about any results without their support.

I feel that I can do no better than to quote the words of our former secretary of the State Board of Health, Dr. W. F. Snow, who said: "The American people must not rest under the charge that they remain indifferent to the presence among them of four times as many syphilitics as there are consumptives, and that three out of every four American boys are sowing 'wild oats' and reaping the gonoccocus harvest." Either these statements are not true and should be branded false beyond a shadow of doubt, or the conditions which have made such truths possible should be sought out and eradicated. That "ignorance is a sure road to guilt" or imagined "guilt" is evidenced by the annual investment of millions of dollars in advertisements by free consultation "philanthropists" who trade on the real and imaginary results of "wild oats" traffic. It is a matter of simple computation to estimate the minimum volume of business which must be based on this enormous advertising outlay, and the probable number of "patients" contributing the capital.

The call of the nation is for facts. The testimony of physicians, clinics, the advertisements of "fakers," the rescue homes, is not enough. We may be staggered by the results of piecing such testimony together, and we may dread further inquiry, but we must know. We must work for the reporting of syphilis and gonorrhea as we now require tuberculosis reported. This can be done without disclosing any patient's identity.

In the meantime the young men, and the young women as well, must be wisely taught that the lure of the red light and the promise of the red press are but decoys of the "Red Plague."

In conclusion, since the municipality is directly concerned in the health and welfare of its citizens, and since their prosperity is to a very great extent dependent upon the establishment and maintenance of healthy conditions, when sanitary measures are enforced to the same degree that they are carried on in the standing armies of every country in the world, we may look forward to the attainment of the ideal conditions which now prevail in such armies.

When that time comes, vaccination against smallpox will be universal, likewise vaccination against typhoid fever will be applied with the same thoroughness as it is at the present time in all of these armies.

Every municipality will maintain an isolation hospital, constructed and equipped to take care of patients suffering with contagious diseases. All water supplies and waterways will be free from sewage. Our general milk supply will come from healthy cattle, will be collected under clean conditions and as a further safeguard, will be pasteurized in bottles. The municipality will exercise inspection and control of all food products sold within its limits. Health officers will be full-time officials and reasonably well paid. Inspectors sufficient to carry on the necessary work and laboratories for performing the duties usually referred to those departments will be supported by or be available to every municipality. At that time public health work will be given the recognition it deserves and every dollar spent will be returned to the public with most satisfactory dividends.

FIFTH SESSION.

Wednesday, October 14, 1914, 8 p.m.

A joint session of the league was held at the Bagby theater, Monterey, when Harold F. Gray, health officer of Palo Alto, delivered an address on the work of the health department of Palo Alto. This address was illustrated with moving pictures taken expressly for this occasion.

SIXTH SESSION.

Thursday, October 15, 1914, 9:40 a.m.

The meeting was called to order at 9:40 a.m., Donald H. Currie, secretary of the State Board of Health, presiding.

CHAIRMAN: Surgeon Woodward of the United States public health service will present a paper on "What the United States Public Health Service Is Doing to Prevent the Spread of Tuberculosis."

WHAT THE UNITED STATES PUBLIC HEALTH SERVICE IS DOING TO PREVENT THE SPREAD OF TUBERCULOSIS.

Surgeon R. M. Woodward, U. S. P. H., San Francisco. Prior to 1899 the United States public health service, then known as the United States marine hospital service, had no separate institution devoted exclusively to the treatment of tuberculous sailors. They were admitted to the marine hospitals, and provided such isolation and treatment as were possible at the several stations. In the large hospitals a ward was set aside solely for these cases, and the usual measures were adopted.

During the years of the Indian uprisings numerous United States army posts were scattered throughout the southwest. As the Indians were decimated or brought into the ways of civilization these frontier posts were abandoned, and only a few care-takers left in charge. When the marine hospital service conceived the idea of establishing a sanatorium for the treatment of tuberculous patients, one of these reservations was offered, and an officer who had made an extensive study of the subject was detailed to inspect them and report upon the most favorable one for the purpose. Among the points taken into consideration were the following: General size of the post, number of buildings, and their availability for sanatorium purposes; climatic conditions; altitude; water supply; accessibility of food supplies and transportation facilities; and the results of treatment in neighboring sanatoriums or among the residents. Fort Stanton, New Mexico, was selected and was opened in 1899. Considerable information contained in this paper has been furnished me by my brother officer, Past Assistant Surgeon F. C. Smith, who has been in charge of the Fort Stanton Sanatorium for several years.

The reservation at Fort Stanton comprises 43 square miles, but the larger portion of this tract is used simply as grazing land for the beef cattle raised for consumption at the station. The buildings and cultivated land cover about two hundred acres. The altitude is 6,200 feet. The station is reached by train from El Paso, Texas, to Carrizozo, New Mexico; and from this point a branch road runs to Capitan, New Mexico, which is about seven miles from Fort Stanton. Buses from the station meet all trains at Capitan. Up to June 30, 1914, the station had treated 2,433 patients, with the following results:

Apparently cured	257
Arrested	375
Improved	610
Unimproved	234
Dead	771
Under treatment	186

These cold figures are not very encouraging regarding the results of treatment, but there are two important points that militate against results at this station. The first is that it is almost impossible to secure patients in the early stages of the disease; and the second is that many patients who are improved leave the sanatorium too early, and against the advice of the medical officers. We all know how reluctant a tubercular patient is to admit to himself that he has lung trouble. He calls it a "cold" and keeps dosing himself with various remedies until he is in such condition that he can no longer continue at his vocation. Then he applies to the marine hospital officer and is frequently found to be in serious condition. Over fifty per cent of the cases are far advanced upon admission, and only a few are incipient cases. This can be illustrated by a table taken from the Fort Stanton report for the fiscal year ended June 30, 1914, as follows:

Prognosis on Arrival.

Favorable	33
Favorable for arrest	42
Favorable for prolongation of life by living under proper conditions	13
Unfavorable	51
Doubtful	2
Non-tuberculous	1
Total	142

Regarding the tendency to leave the sanatorium prematurely I would state that unlike the patients of the army and navy, the seamen of the merchant marine who are treated by the United States public health service are not enlisted men, and are consequently not under the same control. Our police jurisdiction over them relates to the maintenance of discipline, with power to discharge them for infraction of the rules, but does not permit us to retain a patient in hospital against his own wishes. Fort Stanton is an isolated station, and the amusements are only such as can be provided under those conditions; consequently, when a patient improves to that extent that he feels no inconvenience in walking about or attending to light duties he begins to think of returning to civilization. The bright lights of the great city beckon to him, and it is difficult to resist the temptation. It would undoubtedly be better in many instances if the convalescent patients would secure employment on some ranch in New Mexico, where they could live the open life in the country to which they have become accustomed; but a sailor who has roamed all over the world is not temperamentally fitted for employment as a cow-puncher. They return to the city and probably to the sea; do well for a time; and then break down and apply for readmission to a marine hospital. Sometimes they are in condition to be again transferred to Fort Stanton; but in any event they usually decline rapidly or slowly as the case may be, and add their numbers to the mortality list.

The forecastle on a ship is one of the most insanitary places that can be conceived. It is seldom possible to open the port-holes on account of rough weather. The ventilators pour down a strong current of air, and this almost necessarily blows directly upon someone, who does what he can to divert the current to some other part. In very stormy weather it is impossible to keep any ventilator stacks on the forecastle; consequently they are removed and a piece of canvas battened down over the opening. All the sailors smoke strong pipes and the air is blue. In fair weather the crew is frequently fed on deck, but in bad weather the meals are served in the forecastle. The rain-soaked or sweaty clothes are hung up in the forecastle to dry. A posted rule against expectorating on the floor of the forecastle would be a waste of paper, because it would not be observed. It is unnecessary to dilate further upon the environment of these men who have just returned from the sanitary surroundings and rules of Fort Stanton. The average sailors' boarding house is little better than the forecastle as far as sanitation is concerned. Sailors have an inborn antipathy to fresh air at night. In marine hospitals in colder climates I have frequently issued orders to keep a certain number of windows open, and in the morning have found every window closed and the air very close.

At Fort Stanton the treatment consists mainly of a generous diet, plenty of fresh air, and graduated exercise as the patients improve. It is true that various remedies, widely exploited, have been used there, always with the consent of the patients, but they have been discarded one by one, and the curative agent is yet to be found.

Even though the ultimate results in the cases themselves have not been what it was hoped they might be I conceive that the advantages of the sanatorium can be summed up as follows:

1. The patients themselves have been given the advantage of the best climate and surroundings for their particular disease.

2. The close contact formerly obtaining in marine hospitals between tuberculous and non-tuberculous patients has been prevented in large measure.

3. Even though a patient leave the sanatorium prematurely his life has probably been prolonged; he has been removed from close association with his fellows during the most infectious stage of his disease; and has been taught lessons in sanitation that if carried out will at least protect the lives and health of others.

I am informed that the theory of transmission of the disease by close contact is not given as much support as formerly, but we can all cite individual cases where no other theory seems tenable. I beg permission to refer to such a case in a family related to myself by marriage. One sister developed tuberculosis of the lungs. Another sister, then past forty, and apparently in perfect health as far as her lungs were concerned, nursed her with all the care and attention that love and devotion could dictate. Shortly after the first sister died the second one developed a cough, and in due time tubercle bacilli were found in the sputum. The second sister, upon advice of her physicians, was treated in a tent until she died, and no further cases developed in the family. I regard the case of the second sister as explainable only on the theory of direct transmission.

We frequently receive in a marine hospital a tuberculous patient who is too ill to be transferred, and he is kept until he dies; or we have one who is compelled to remain with us until his temperature falls, and he is in suitable condition to travel. In these cases we attempt such means of isolation and prophylaxis as are possible. They occupy a ward set aside for their exclusive use. Their dishes are kept in the ward and are not returned to the kitchen. They are not permitted to assist in the preparation or issue of food to the other patients. They use paper sputum cups containing an antiseptic solution, and these are burned each day. In spite of such precautions the patients, when able to be about, will visit with one another and indulge in a social game of cards in the smoking rooms. We know that there is a detestable but widespread custom of wetting the fingers while dealing the cards, and it does not require a great stretch of imagination to picture the direct transfer of tubercle bacilli from the mouth of one patient to that of another.

Each patient transferred to Fort Stanton is given a letter of instructions, which contains among other things the following paragraph:

> You will scrupulously avoid soiling the floor, furniture or bedding of passenger or sleeping cars with spit. You will be particularly careful not to spit anywhere about the cars or waiting rooms, but to use your own spitcup, which at all times you must keep partially filled with the five per cent solution of carbolic acid furnished you. You will empty your spitcup down the water closet, but not until the spit has been in contact with the solution for at least ten minutes. Use your own drinking glass, and do not allow any other person to use it.

Aside from the activity of the service in treating tuberculous patients various other efforts have been made to assist in controlling the spread of tuberculosis. On October 30, 1912, the following amendment to the interstate quarantine regulations was issued:

> Common carriers shall not provide in cars, vehicles, vessels, or conveyances operated in interstate traffic, or in depots, waiting rooms, or other places used by passengers traveling from one state or territory or the District of Columbia to another state or territory or the District of Columbia any drinking cup, glass, or vessel for common use; provided, that this regulation shall not be held to preclude the use of drinking cups, glasses, or vessels which are thoroughly cleaned by washing in boiling water after use by each individual, nor shall it be held to preclude the use of sanitary devices for individual use only.

On December 9, 1912, another amendment to the interstate quarantine regulations was issued, reading as follows:

> Common carriers shall not provide in cars, vehicles, vessels, or conveyances operated in interstate traffic, or in depots, waiting rooms, or other places used by passengers traveling from one state or territory or the District of Columbia, to another state or territory or the District of Columbia, any towel for use by more than one person; provided, that the towels may be used again after having been sterilized with boiling water.

In order to encourage the disinfection of the forecastle and other parts of the ship from which cases of tuberculosis have been taken the following circular letter was issued by the surgeon-general February 27, 1913:

> In order to aid in the prevention of the spread of tuberculosis among seamen of the merchant marine the following rules shall be observed whenever practicable:
>
> Whenever a seaman suffering with tubercle of the lungs applies for treatment at a relief station of the service the medical officer or acting assistant surgeon in charge thereof shall notify the master or accredited agent of the vessel on which said seaman sailed immediately preceding his application for relief, and, if said vessel is in port shall, with the consent and aid of the master, owner, or agent of the vessel, disinfect the forecastle or other apartment previously occupied by the aforesaid seaman.
>
> The method of disinfection shall be as follows:
>
> 1. Thorough mechanical cleansing of floors, walls, and bunks with hot water and concentrated lye.
> 2. Wetting floors, walls, and bunks with the following solution:
>
> | | |
> |---|---|
> | Carbolic acid | 5 parts |
> | Water | 100 parts |
>
> Clothing and bedclothing which the patient has used should be immersed in this solution for 24 hours, unless disinfected in a steam chamber.
>
> Forecastles should be painted or whitewashed after disinfection, when practicable.
>
> Masters, owners, and agents of vessels should be informed of the importance of compliance with the provisions of this circular.
>
> A report shall be rendered to the bureau of every forecastle disinfected under the provisions of this circular as soon as the disinfection shall have been effected.

The foregoing circular letter is transmitted to the agent of the steamship line with the following letter of transmittal:

> I beg to inform you that Seaman--------------------------------, age ------, nativity ------------------------, whose papers show that he was last employed on the S.S. -------------------- from (date) to (date) has been admitted to this hospital for treatment of tuberculosis of the lungs.
>
> Your attention is invited to the enclosed circular letter regarding this disease, and it is urged that you have this matter attended to at once in order to protect the lives and health of the other members of the crew.
>
> If you will communicate with the United States quarantine officer, Angel Island, California (telephone Douglas 347), he will disinfect the vessel for you.

It is unnecessary to state to this convention that the United States public health service and the hygienic laboratory under its control stand ready at any time to investigate any treatment or measure that holds out promise of benefit to those suffering from tuberculosis, or promise of assistance in preventing the spread of this disease. It will be recalled that when the Friedmann turtle serum was brought to this country, and given widespread newspaper publicity, it was the hygienic laboratory of the United States public health service that made the official investigation and pronounced the treatment useless. We all look with longing eyes to the day when someone may appear with a treatment or a prophylactic that will produce real results.

Dr. Woodward's paper was discussed by Dr. William C. Hassler, chief sanitary inspector, San Francisco, and Dr. Allen F. Gillihan, Oakland.

Dr. Allen F. Gillihan, Oakland: As we are now a permanent organization, I move that we make Doctor Currie chairman for the ensuing year.

The motion was duly seconded and carried.

Dr. William Simpson then nominated Dr. George E. Tucker as secretary-treasurer. The nomination was seconded by Dr. W. J. Stone and carried.

Upon motion of Dr. F. W. Browning, Dr. W. A. Sawyer was named as the program committee for the next session.

SUGGESTED LINES OF DEVELOPMENT FOR OUR STATE HYGIENIC LABORATORY.

CHAIRMAN: Doctor Sawyer will now present his paper on "Suggested Lines of Development for our State Hygienic Laboratory."

DR. W. A. SAWYER, director of the bureau of the hygienic laboratory of the California State Board of Health:—Once a year, as health officials of California, we gather together to discuss our experiences and to plan a more effective statewide campaign against disease. Unless the health officials know what work the bureau of the hygienic laboratory is prepared to do, and unless the bureau understands their needs, even in the most remote corners of the state, extensive cooperation will be impossible and the public health will suffer in consequence. Today I am laying before you in brief outline the past history of the bureau and its future plans.

The state hygienic laboratory was established at the University of California in Berkeley over nine years ago. At first its activities were largely limited to routine diagnostic examinations. Since the beginning there has been a steady increase in the number and variety of laboratory examinations performed. Gradually epidemiological field investigations became a considerable part of the work of the staff, and finally the epidemic of rabies necessitated the manufacture and administration of the Pasteur antirabic virus. These various functions were recognized by the State Board of Health in January, 1912, when it reorganized its administrative system and designated the state hygienic laboratory as the bureau of the hygienic laboratory with divisions of biological examinations, preventive therapeutics, and epidemiological investigations. The most recent additions to the work have been the manufacture and free distribution of typhoid vaccine and the performance of the Wassermann test for syphilis. This last step is of greatest importance as it shows an awakening public feeling of responsibility for one of the most serious of preventable diseases.

To indicate briefly the present extent of our work, I will give a few figures from the statistics for the biennial period ending June 30, 1914. The number of routine examinations was 7,512, and the increase over those of the previous two years was 75 per cent; 770 examinations for rabies were made, a number three times as great as that for the preceding period. The number of bacteriological examinations of drinking water supplies was doubled and reached 309. In the last three months the Wassermann test was made for 142 patients, a good beginning for this new function. The Pasteur antirabic treatment was administered to 466 persons. Sensitized typhoid vaccine was sent to 171 physicians for 1,822 patients during the last four months of the period. Seventy-six special investigations in the field or in the laboratory were carried on. Some of these involved research extending over a number of months. Specimens for examination were received from 394 towns and cities. Mailing outfits were kept in stock in 169 depositories, usually local drug stores, for free distribution to physicians who send specimens to the laboratory or one of its three branches.

Looking toward the future we see that there should be a decided increase in the routine diagnostic tests if public health administration is to be put on a thoroughly scientific basis. Where health officers are now using the laboratory for the examination of diphtheria cultures for determining diagnosis and time of release from quarantine, in the future we shall see a much larger number of cultures taken to detect the chronic carriers which are perpetuating this disease. Where households, schools, or institutions are troubled with ever-recurring cases of diphtheria, the carriers will be discovered through laboratory tests and the long series of illnesses will be suddenly and permanently interrupted. The laboratory is now ready to do its part wherever the health officers will plan the work and devote the necessary time to the local investigations.

Similarly in the control of typhoid fever the work will grow rapidly owing to an increased dependence upon the laboratory. More and more requests are being received for examination of the feces of convalescents from typhoid fever whose occupations are such as to endanger the public in case they become typhoid carriers. Cooks, waiters, and dairy employees are being watched. The public is learning that typhoid fever is unnecessary and will demand more and more protection.

We could multiply indefinitely the lines in which the work of the laboratory is expected to develop. While continuing to do in increasing numbers the standard diagnostic tests for typhoid fever, diphtheria, tuberculosis, malaria, rabies, gonococcus infections, and syphilis, the laboratory will find it necessary to add other tests as they are discovered and perfected for one disease after another. We must depend to a large extent on the local health officers to see that the work for their communities develops in the directions which will bring the greatest possible returns in a decrease of the death rate and an increase in the efficiency and well being of the people.

To prepare for the natural growth of the laboratory the system of depositories should be put on a basis of greater usefulness. Health officers can help greatly by looking over the stock of mailing outfits in the local depositories and helping the druggist to anticipate the needs of the community. In some towns where depositories are needed, the health officers have not yet recommended drug stores for this purpose, and the physicians find it necessary to write to Berkeley for their outfits. In the coming year we intend to work out some system by which the depositories will be kept automatically in closer touch with the laboratory and will be given more publicity. At present physicians are often unaware of the existence of a nearby depository. Any system which makes the sending of specimens convenient and reduces the time spent in waiting for a laboratory report will increase the use of the laboratory and the public benefit to be derived from it. The cooperation of health officers in the perfection of the system of depositories is expected.

The service of the laboratory will be geographically more even if the branch laboratories are developed. These laboratories were established in Sacramento, Fresno, and Los Angeles in order to shorten the time necessary for sending a specimen to the laboratory and receiving a reply. The work is increasing rapidly, especially in the southern branch. Because of distance from the main laboratory in Berkeley the southern section of the State has not used the laboratory as much as the central and northern parts. This is being corrected by the increasing activity of the southern branch in Los Angeles. I believe that this branch should be developed until it is able to handle several times the present volume of work. That this will be necessary is shown by the present rapid increase in the work being done for the health officers and physicians of southern California.

The control of milk supplies involves laboratory examinations, chemical and bacteriological. So far the bureau has been unable to assist in this important work, owing to the futility of making bacterial counts of samples which have been transported over long distances. As a result most of the smaller communities have inadequate protection against milk-borne diseases. Some system must be worked out by which the hygienic laboratory can assist local authorities in having the necessary tests made.

We have been facing a most unsatisfactory situation with regard to the investigation of public drinking-water supplies. Much to our shame there has been a considerable amount of water-borne typhoid fever in our State. An increasing demand for bacteriological examinations of water supplies shows an awakening interest in the situation. While the bacteriological examination is of value in differentiating between safe and unsafe waters, there are many supplies in which a decision can not be made without a local investigation by an expert. Until the State Board of Health has the services of a sanitary engineer who can devote his time to the supervision of investigations of water supplies and sewage disposal, much of the value from laboratory examinations will be lost. The laboratory work should be subordinate to extensive field examinations. I can not but believe that such an expert, with necessary assistants, will be provided in the near future, as it is obvious that a considerable part of our typhoid fever is at present due to the State's neglect of the supervision of stream pollution and public water supplies. For example, in the spring of the present year the laboratory demonstrated pollution in the water supply of one of our cities, but the matter was not corrected owing to lack of expert instruction for the local officials and of the "follow-up" which is needed to insure the correction of dangerous conditions. Late in the summer an extensive epidemic of typhoid fever appeared and was traced by the bureau of the hygienic laboratory to the public water supply. The laboratory is eager to take part in the improvement of our water supplies under the direction of an expert sanitary engineer just as soon as the State will provide his services. He would be invaluable as an adviser to health officials, and he could prevent many cases of typhoid fever annually, to say nothing of those inexcusable occasional explosive outbreaks. I would like to see the entire time of one laboratory assistant devoted to the work of examining water samples bacteriologically, so that the public supplies would be examined even before they came under suspicion because of the presence of disease. A regular periodical examination under the direction of the government is being made of all water used on railroad trains. Why should not our public drinking waters throughout the State be kept up to a definite standard of purity? It seems that the present defect is not due to lack of compulsion of local officials by the State so much as to lack of the study of our common problems, the establishment of standards, authoritative advice to municipal and county officials regarding public needs, and publicity regarding actual conditions.

In the control of communicable diseases in general, as well as in the prevention of water pollution, the responsibility of the State does not end with the furnishing of laboratory examinations. It is important that the State Board of Health should have the entire services of skilled epidemiologists who can be sent to the scene of every unusual outbreak of communicable disease to study the origin of the trouble and to cooperate with the local health officials in preventing its spread. In addition to the study and control of epidemics these men should prevent outbreaks of disease by observing deficiencies in local health administration, unsanitary conditions, infractions of health laws and regulations, and, in general, those unguarded points at which preventable diseases is about to fasten itself upon the people. On a small scale the division of epidemiology is now doing the work by assigning members of the staff of the hygienic laboratory to field work whenever their other duties will permit. The division of epidemiology is not at present able to meet adequately the pressing need for local investigation of disease. At least two trained men should devote their entire time to epidemiological work. If the State will allow us this addition to the staff I am sure that the returns in health will more than justify the expenditure in salaries and traveling expenses. Leaving this work largely to local communities is not logical, as communicable disease travels rapidly over our highways, railroads and watercourses, and no community keeps its diseases to itself.

The division of preventive therapeutics has great possibilities for development. At present the laboratory manufactures only two biological products, typhoid vaccine and antirabic virus, leaving the distribution of smallpox vaccine and diphtheria antitoxin entirely to commercial laboratories manufacturing under government licenses. While the popularizing of biological products which protect the public health could be furthered by their free manufacture and distribution, I am not recommending an immediate increase of this function, as I believe that the State will get more real benefit, dollar for dollar, from expenditures for expert service in sanitary engineering and epidemiology.

The function of research will be recognized more and more in each division of the bureau. Our problems are different from those of any other state. The material which comes to the attention of the laboratory staff furnishes the basis for studies in local problems in preventive medicine and the results will appear from time to time in the bulletins of the State Board of Health and in scientific journals. Local health officers should likewise publish their observations of outbreaks of disease and accounts of successful methods of prevention. In this way we will build up a valuable foundation of experience upon which to rest a successful health administration for the entire State of California.

The lines in which I expect the greatest advances in the bureau of the hygienic laboratory during the coming year are, briefly, a decided increase in the number of diagnostic examinations, a special campaign against water pollution, and the establishment of an efficient field force for the study and prevention of communicable disease.

Discussion.

DR. CHARLES R. BLAKE, Richmond: I think there is one thing that might be considered by the state laboratory and that is the furnishing of free antitoxin.

DR. F. REEVE WOOLSEY, Albany: Mr. Cutter, of the Cutter analytical laboratory, will furnish free antitoxin for the poor.

Dr. Stanley P. Black, Pasadena: I believe our hygienic laboratory has done excellent work during the life of it, for the funds it has had to expend. I had the direction of the southern branch laboratory for a number of years, until I found it was costing me $50 to $100 per month to run it and I could not afford to do it. I found this the only criticism —that the State makes it too easy to get the free treatment for rabies. I do not believe the State should take over cases that can afford to pay for it, even if they can only make small payments monthly. The difficulty in the bacteriological work is the time feature. While I was in charge of the southern branch I always got the reports out according to their request. However, I found that I would often get a telephone message saying "Why have we not had a report?" There had been a delay in the mail, sometimes a very serious delay. In regard to water examinations, I think the time is practically thrown away. There is positively no use of a bacteriological examination unless there be a field investigation. I have always refused to do this work unless there is a field investigation. The finding of colon bacilli does not amount to anything. I think the hygienic laboratory has been of great value to the community.

Dr. William Simpson, Santa Clara county: The examination of the water has been the greatest help to me in my county.

Dr. F. E. Corey, Alhambra: I wish to thank Doctor Sawyer for the consideration he has given southern California. I know we certainly need the laboratory.

RABIES AND ITS CONTROL.

CHAIRMAN: We will now have Dr. Bogle's paper on "Rabies and Its Control."

Dr. S. S. Bogle, Santa Rosa:—Rabies is an acute, specific, rapidly fatal disease, more prevalent in carnivora than herbivora, and communicated to man by direct innoculation through a wound made by the teeth of the infecting animal. The exact nature of the virus, contained in the saliva, is unknown.

Presuming that we, as health officers are particularly interested in the *isolation*, *quarantine*, and *control* of this disease, it is a useless waste of time for me to dwell on the etiology, pathology, symptomatology, diagnosis, and treatment. For all of these, I refer you to any of the numerous standard text books.

Quarantine and regulation for the control of rabies should be under the direction of the State Board of Health, and carried out by the local health officer. My experience has been that the cooperation of the local officials is always halfhearted, inefficient, and retards the work of effective quarantine. The average community regards the health officer and his deputies, as people gone crazy over some supposed public danger, where there is, in reality, none existing. They believe themselves interfered with, only for the pleasure of these officials. They well know there is absolutely no danger from rabies, because Bill Jones, who lives up in the mountains, has owned dogs all of his life, and said there was no such disease as rabies, because his dogs never had it.

An annual license should be required to be paid on every dog in the State. It should be imposed by the State Board of Health, become a part of the regular taxes, and payable to the regular county tax collectors. Such a regulation will decrease the number of dogs in the State, and particularly get rid of that class of dogs known as tramps or rovers. These are the most dangerous class for the spread of rabies.

In an outbreak of rabies, the State Board of Health should place a quarantine over the county, or such portion thereof deemed advisable, immediately. The local health officer should be instructed to employ the necessary number of deputies with motorcycles. These are to enforce proper quarantine regulations, by daily rounds made through the quarantined territory. These regulations should include the effective muzzling of all dogs which are not chained, or kept within an enclosure sufficient to prevent their leaving the immediate premises of the owner.

The local press should be used as a means of giving the greatest publicity possible, to every phase of the disease, and its extent. Warn the public as to the extreme importance of their cooperation in the eradication of this disease, by strict observance of all the rules of the quarantine, and by reporting to the local health officer or his deputies, anyone refusing to observe them.

Any dog showing a condition suspicious of this infection, should be taken to a veterinary surgeon, and there isolated for a ten days' period of observation. Any person violating quarantine regulations, should, after fair warning, be placed under arrest. The State Board of Health should insist that the different justices of peace impose sufficient fine to prevent recurrence of such offense.

In a recent epidemic of rabies in Sonoma county, I did not have the proper cooperation of the public in the enforcement of quarantine regulations. Instead, I had their open opposition, and was called everything from a fool to a grafter. Furthermore, in the midst of the quarantine, the board of supervisors repealed the ordinance requiring the muzzling of all dogs, and the State Board of Health was forced to quarantine certain portions of Sonoma county. For these reasons, I most heartily recommend that the enforcement of all quarantine regulations be by the authority of, and under the specific direction of the State Board of Health. It might be of interest to know that there were issued in Sonoma county 5578 dog licenses at one dollar each for the year 1914.

Discussion.

MR. HAROLD F. GRAY, Palo Alto, told of the experience of that city in endeavoring to prevent the spread of rabies. The adoption of a city ordinance and the successful enforcement of same.

DR. JOHN WEHRLY, Orange county, discussed the difficulties he had in attempting to have dogs muzzled.

DR. ALLEN F. GILLIHAN, Oakland, told of the passage of a muzzling ordinance in his city and the difficulty of having same enforced and the need of machinery for enforcing the State Board's orders.

DR. L. M. POWERS, Los Angeles, told of his experience in getting a muzzling ordinance passed and the strong local opposition to its enforcement.

DR. WILLIAM SIMPSON, Santa Clara county, stated that in every case where rabies had been brought to his attention the person had been bitten by the family pet dog.

Dr. J. J. Benton, Berkeley, related the experiences of the health officers of Richmond, Oakland, Alameda and Berkeley working together to prevent the spread of the disease and the request made to the railroad companies to prevent dogs coming from San Francisco.

Dr. L. R. Willson, Fresno, told of the difficulty experienced in enforcing a muzzling ordinance in the city when the county dogs are unmuzzled and can come in and attack the city dogs.

Dr. S. S. Bogle, Sonoma county, told of the revenue that could be derived by taxing dogs, this money to go to the State Board of Health, the protection it would afford owners of valuable dogs as the owners of worthless animals would not be willing to pay the tax and recommended that the conference take some action regarding same.

Dr. W. C. Hasslar, San Francisco: "I move that this matter of an annual tax on dogs, the money to be appropriated for State purposes, be placed in the hands of the committee on legislation."

The motion being seconded by Dr. Allen F. Gillihan it was carried unanimously.

SCHOOL INSPECTION.

CHAIRMAN: The next number on the program will be the paper of Dr. William Simpson on "School Inspection."

Dr. William Simpson, San Jose: C. M. Osenbaugh, principal of the San Jose high school says:

"1. Educate the public to secure the *necessary* financial support, and the *desired* moral support.

Show that the expenses incurred in medical inspection will reduce the number of retarded children, and thus produce an actual saving in terms of dollars, teachers, school plant, equipment, and child's time—is a business proposition.

In a community of two hundred and fifty children, a saving of ten per cent in the promotion rate represents an annual saving of over $5,000.

Show where medical inspection has been established, diphtheria has fallen off two thirds; scarlet fever, five sixths.

In non-contagious diseases inspection removes a large proportion of physical defects which cause retardation.

2. The plan itself:

a. Daily inspection for contagion.

b. Annual physical examination of each child.

c. Visit children when necessary, and advise and supervise parents control.

d. Cooperation of all concerned in the welfare of the child. A school nurse who shall report to the family physician might be a great help.

3. How to do work:

Teacher selects suspects for doctor.

Teacher makes easy physical tests and reports to superintendent's office or to inspector himself, who then maps out his day's work according to urgency of cases.

Inspector examines each child once each year and reports finding on card (should not take over ten or fifteen minutes per pupil).

Report necessary medical treatment to parents. Have school nurse visit homes when necessary.

Medical inspection in Denver is a decided success. It pays for itself in the number of children who are helped through school in a shorter time.''

Miss Agnes E. Howe, principal State Normal Training School, San Jose, California, says: ''Medical inspection of school children has undoubtedly gained such a hold that it can no longer be called a fad. Whether its vogue is the result of judicious advertising by the A. M. A., or whether there is an actual need, and the results have justified the work and the expense, is still questioned.

When medical inspection contents itself with the examination of children, and makes no attempt to remove the conditions in schools that tend to undermine health, it seems to me that it falls far short of what might be accomplished.

Statistics of examinations show conclusively that many school children have myopia, scoliosis, anaemia, adenoids, defective teeth, retardation in physical growth, etc. When these are largely the result of school conditions, such as overcrowding, bad ventilation, unhygienic school-desks, poor lighting, lack of freedom and opportunity for out of door games or wholesome physical exercise,—conditions that are found in almost any school building in California, it is high time that some power in the state should undertake the task of remedying them.

It will do comparatively little good to examine hastily thousands of children and tabulate their defects in impressive columns, unless intelligent steps are taken to correct such defects in the present and prevent them in the coming generation. One trouble is that the findings of inspectors are criticized by family physicians who are jealous of what they consider their rights.

Opinions are apt to clash where financial interests are at stake.

Recently a girl was examined by a school physician who reported her as having all symptoms of tuberculosis. The next day she brought to the head of the school a statement from a physician in the city that she had no sign of the disease.—'When doctors disagree,' etc.

As things are now the public is compelled to pay for the inspection of children, and it naturally follows, that the public has a right to demand something in return. It is not too much to say that it has a right to expect from medical inspection largely what it intelligently demands of it, and according to the sort of support it has given to it. If the public does not know what adequate inspection involves in the way of skill, organization, and support, it is likely to get haphazard results. Before the best results can be expected or obtained, the State must insist that those who go into the schools to look after the health and normal development of children, must be appointed by reason of special fitness. Professional jealousy and personal politics should have no place in these appointments.

We need health inspectors who know about education; who know more about the normal growth and development of children, and more about physical education and general hygiene, than most of them do after graduation from medical colleges. We need more doctors of public health than doctors of medicine, but before we can get them the public must be educated to ask for them and to pay for their services when secured.

The term medical inspector or school physician is an unfortunate one for naming what ought to be the chief work of the health officer for schools. School children would need little medicine and less medical advice if we had more sanitarians and doctors of public health to teach them and their parents how to be clean, how to eat, sleep, and take care of their health in every way.

The chief duty of the public and the health officer lies in removing the causes which contribute to physical unsoundness and disease. As long as children are herded in schools where they must breathe impure air, bend over unsanitary school desks, work at books when they need physical exercise, allowed by their parents to attend 'movies' when they should be playing or sleeping, just so long will there be disease among them. Medical inspection will not and can not save children from degeneration and disease unless it can lead to a clearer understanding of the result of unhygienic living. It might supplement the work of school teachers very materially along such lines.

It seems foolish to shut up our well children in unventilated and improperly lighted school rooms, furnish them scanty or no play grounds, compel them to live a life not in accord with the laws of physical development, and then, when they become anemic, nearsighted, and defective generally, make a great stir about special classes for defectives and spend in building special schools money better spent in keeping people well. The public must learn that it is far more important to furnish conditions which promote the health and development of well children than it is to make special efforts to care for those who are sick or defective, especially when their defects have been largely induced through neglect.

Today the State compels the attendance of children in school—in houses which are built entirely under the direction of school trustees who have no expert knowledge. In country districts they are always busy men or women; in cities, too often they owe their appointment to political influence. In either case they are ignorant as to hygienic requirements of school buildings.

Again, janitor service is nothing from a sanitary standpoint. It means stirring up the dust every day, and cleaning once a year. Teachers have been powerless so far to remedy any but the most glaring defects, and will welcome the aid of intelligent health inspection.

Teachers want health officers whose chief delight is in finding and developing beautiful cases of physical perfection rather than in finding some obscure and rare disease. They want doctors who will be more delighted in exhibiting a large list of healthy, well-developed children than a long list of those who are physically defective and diseased.

To be sure they must be able to see defects and diagnose correctly, but their chief emphasis should be in preventive measures.

Given then medical inspectors who know more about education; more about the hygiene of teaching; more about the normal demands of child life; who have the ability to work with teachers and the people for the general welfare of the community; and they will be welcomed and valued as coadjutors by every progressive school man or woman."

Alexander Sheriffs, Superintendent of Schools, San Jose, Cal., says: "Medical examination of school children, when followed up by consistent efforts to remedy the physical defects noted, is, I feel, of the utmost importance.

The work should be undertaken only by physicians trained to handle such lines. In San Jose, after six years of experience, the principals and teachers have noticed a large number of cases where backward and even abnormal children, have, by this means, been restored to normal health and have caught up with their classes.

To punish a child or retard his advancement because he can not see, or can not hear, or is in bad health on account of adenoids or defects from any cause which can be removed, is in this age, in my opinion, positively criminal.

First develop healthy, strong children, in possession of all their normal faculties, then give them an education."

C. H. Waterman, probation officer of Santa Clara county, says: "This statement is made not from a theoretical standpoint, but based entirely upon our actual experiences with wards of the juvenile court. We have had a number of cases of habitual truants and some who were supposed to be bad, careless, and who would not study. Upon a medical examination of these children, it was found they had adenoids, enlarged tonsils, defective eyesight or hearing and, following the diagnosis of the examining physician by treatment, the children became much more efficient in their work and more contented both at home and in school. Children are not responsible for their physical infirmities, and if there is a remedy, we owe it as a duty to the children both from the standpoint of humanity and economics to furnish them relief."

J. E. Hancock, principal Grant grammar school, San Jose, Cal., says: "Systematic and persistent medical inspection is one of the best innovations ever introduced into the public schools. It pays from every angle from which it may be viewed. It is a great educator of ignorant or careless parents, who would otherwise neglect their children's health.

It emphasizes the importance of good health in the minds of the children, because of the attention given it by the State. It is remarkable aid to the teacher in diagnosing cases of mental defectiveness.

So far, in our schools, the inspection has been largely limited to an examination of the eye, ear, throat and anemic.

The parents are notified and a great many of them respond by having the children treated.

Others are too poor, and the county has been very generous in coming to their rescue.

This is as it should be, but there are many parents who disregard the report of the inspector.

These cases should be followed up by paid nurses and the parents compelled to see to it that their children receive proper treatment.

There is no doubt about the good results so far accomplished in San Jose. I believe that some preventive measures should be looked into, some of which are in the province of the public authorities—better air (a standard for each school room).

Heaters should be provided to dry children's feet in wet weather.

Where the forced system air-ventilation and heating is used there is practically no provision for drying wet feet.

Dusty playgrounds should be watered daily in the dry season.

The proper humidity in the air should be maintained where the hot air system is used.

More, not less, inspection is my recommendation."

Miss Clarissa Hale, Christian Scientist, says: "The effort to establish a compulsory medical inspection of schools is a part of the campaign waged by a certain faction in the A. M. A. to establish a national department of health and through that to effect a monopoly of medical practice.

There is no objection to inspection for those who wish it; but the right to control one's own body is individual and inalienable, and compulsory medical inspection infringes on that right.

Unless inspection is compulsory it will not accomplish the purpose for which it is intended.

It is of no avail without the follow-up system, without the power to enforce the orders of the medical inspector, and here again individual liberty is infringed upon, and the privacy of the home.

Contagious diseases would not be reached unless the children were constantly under medical supervision. The occasional rounds of the medical inspector would not suffice. The position of medical inspector is one subject to political chance and change, so there is no certainty of competency.

Dr. Cabot has said that out of one thousand cases diagnosed by him, fifty per cent were incorrectly diagnosed.

If these unsatisfactory results are obtained by such a careful and eminent diagnostician as Dr. Cabot, of what value is medical inspection by men of less experience in the crowded schoolroom where the examinations must be more or less superficial?

Then there is the moral aspect of the situation, as where, in some of the eastern schools, young girls were partially stripped and examined."

Cases reported by Miss Hale—names withheld by request:

1. Little girl nine years of age given antitoxin at school on account of diphtheria scare. Child in good health at the time. Developed heart disease caused, according to family physician, by the poison on antitoxin. She was ill for several years and finally died.

2. Girl whose throat had been examined at school, immediately developed abscesses of the throat, said by physician to be due to infection or injury received during school examination.

3. Mother visiting school during examination saw physician examining children's throats using the same spatula on all, merely wiping it on a towel each time. When asked if this method was sanitary, he replied that they could not be so careful when examining so many.

4. A case of eyes pronounced perfect when they were causing, and had previously caused, a great deal of trouble.

5. Two children in one family, eyes examined by inspector. The one told to wear glasses was not in trouble and the one whose eyes were pronounced perfect was suffering severely from eye-strain.

6. Case pronounced tumor in the head by school inspector. Eye defects that were not detected were solely responsible for the severe headaches by which tumor was diagnosed.

7. Boy given a slip after examination stating that he was blind in one eye, had eye, ear and throat disease, and was suffering from malnutrition and fainting fits. As matter of fact did not know what fainting fits were, and was proclaimed by family physician, on examination, to be the healthiest specimen he had ever examined.

Any teacher of ordinary intelligence watching children constantly is a better judge of their health than an inspector who at best can only give them a cursory examination.

Mrs. A. M. Olinder, principal East San Jose grammar school, says:

"Reasons for Health Inspection of Our Public Schools:

People are more important than things.

The object of education should be to develop physical health, encourage economic efficiency and increased intellectual vigor.

Ignorance, as well as intelligence, tends to perpetuate itself. That is why compulsory education is necessary.

In the school of the future it will be compulsory health.

Compulsory school health can be achieved only by the passage and enforcement of laws having that object and effect.

Defectiveness not only inhibits or limits education and leads to dependency, disease and death, but usually unnecessarily adds to the time, labor and expense of parents, schools and states.

The mere fact of parentage does not confer knowledge or appreciation of the child's physical or mental defectiveness, nor does proof thereof insure the cooperation of parents for its correction; for these reasons:

Compulsory school medical inspection, or, rather, school health, is necessary, and the California law which reads "permissive" should read "compulsory," with mandatory regard to the rectifying of physical defects.

I believe only eighteen states have laws for physical examination of children, and in ten of these it is permissive; in the other eight, mandatory.

In only one state, Colorado, is the care of the child's defectiveness, discovered by the examination, made mandatory on the parent, or upon the community, if parents are unable to pay for the correction of such defectiveness.

Aside from the moral fact, we are all more or less our brother's keepers, but physical examination of school children and the correction of their defectiveness is a community right upon which it is our right to insist that the State take up its responsibility in no half-hearted way."

Note by Mrs. Olinder: "It is my experience that parents, even in the most insistent cases, pay little or no heed when their attention is called to the physical condition of their children."

Dr. E. H. Coleman, Sunnyvale, California, says: "It was a great pleasure as well as an education to me to have been able to observe the medical inspection of the grammar schools of a large city, the largest in a large state. Arrangements were made with the principal to take in the rooms one at a time; the boys first, the girls afterward.

The pupils were examined singly and separately in one of the cloak rooms.

The inspecting physician was stationed by a window giving a good light, and supplied with a throat mirror and a wooden tongue depressor for each case. Sterilized towels and antiseptics for hands and instruments were conveniently placed. The eyes were first examined, using a test card; then the throats, using a tongue depressor only when the pupil could not open the mouth enough to give a satisfactory view of the throat. No tongue depressor was used a second time.

When the throat mirror was once used it was disinfected before being used again.

Next, the skin of the chest or back was examined for eruptions, and the condition of the scalp and clothing observed.

The girls were examined (separately, of course) in the presence of a teacher, and the back, not the chest, was examined to determine the condition of the skin.

The children seemed to enjoy the process, making no objections.

Everything was done systematically and thoroughly and much good must have resulted, as many cases of eye-strain, diseased tonsils and skin troubles were discovered.

These were reported to the parent or guardian of the child and while all were not corrected, many were, and I wished every school might have regularly such inspections, as epidemics of children's diseases would soon be a thing of the past if the remedies could be applied in every case."

Dr. F. O. Edwards, osteopathic physician, San Jose, California, says: "Osteopathic Research Institute at Chicago, Ill., has demonstrated that spinal curvatures and minor vertebral and rib deviations may and do predispose to almost any disease or deformity by way of their inhibitory or stimulative effect upon the nerve and blood supply to any or all organs and tissues of the body. Very few, if any, of the medical inspectors of school children are skilled in detecting the spinal deviations and rigidies in their incipiency—the time when cures may be effected.

Therefore I recommend that the examiner be educated and experienced in this very important phase of the examination, or that a specialist be employed in this department, as is done with regard to the teeth. In this day of specialization few physicians are capable of making thorough examinations of all parts of the body. In the absence of such an all-wise examiner, the inspection of school children might be performed by three individuals, viz., a regular physician, an osteopathic physician and a dentist.

We find in our practice that defective vision, defective hearing, nasal and throat affections, impaired mentality and lowered vitality are often caused by vertebral lesions and are amenable to their correction, osteopathic and orthopedic. I am asked to give, from an osteopathic viewpoint, my opinion and suggestions on the medical inspection of school children now in vogue. I heartily endorse the work now being done, excepting compulsory vaccination. I should favor a more rigid enforcement of quarantine and sanitary measures, and oppose compulsory treatment, prophylactic or otherwise, which may render our schools experimental stations for proving or disproving theories such as our army and navy have been subjected to in recent years.

The method of selecting examiners might be improved upon by adopting the civil service system, the competitive examinations being made applicable to the work to be done and open to all registered physicians.

In addition to the methods of examining and diagnosing now employed, I should recommend that more thorough orthopedic and, what might be termed, osteopathic examinations be made. Many diseases and deformities are now recognized, by all schools, as being of spinal origin. Clinical experience, corroborated by animal experimentation in the A. T. Etill authorities, tell us that most spinal curvatures have their beginning between the ages of seven and fourteen, and that they are due to injuries or faulty posture in standing and sitting.

Realizing the importance of skeletal examinations, and the neglect of same, the members of the osteopathic association of the Santa Clara valley have tendered their offices and services for making such examinations of school children, advising them, in corrective exercises, to stand and sit correctly, and for treating a limited number of deserving cases."

The opinion of the alienist, both upon juvenile court and criminal court subjects, is invaluable. Judges and probation officers become more or less proficient in detecting mental weaknesses and peculiarities, but only the trained specialist can in many cases detect the real condition of the subject. The specialist helps not only by detecting the mental deficiency or disease which excuses or paliates crime or delinquency, but is also able to point out fitness or unfitness for particular employment and aptitudes for others in those who are, popularly speaking, sound and normal. In the sphere of physical defects (if the distinction can be made between the physical and the mental) the physician is the only agent who can determine the child's condition; whether he is a fit subject for an institution, or whether his fault may not arise from some physical disease or weakness. In this juvenile court work is a wide field for the unselfish ambitions of physicians. At present this work is ill paid or not paid at all. The time will come when the trained medical man will be attached to every large criminal court and to every juvenile court in the state—as necessary a functionary as the judge himself.

CHAIRMAN: We will now have a recess until two o'clock.

SEVENTH SESSION.

Thursday, October 15, 1914, 2 p.m.

The meeting was called to order at 2:10 p.m., Dr. Donald H. Currie, secretary of the State Board of Health, presiding.

CHAIRMAN: Surgeon R. M. Woodward of the United States Public Health Service will present Surgeon J. H. Long's paper on "The Present Situation with Regard to Plague."

THE PRESENT SITUATION WITH REGARD TO PLAGUE.

SURGEON WOODWARD: "In order that a clear understanding may be had of the present situation with regard to plague in the State of California, it will be necessary to review briefly the past history of plague in the State.

Plague was first reported in California about the year 1900, and from then until 1904 cases occurred from time to time.

From 1904 until 1907 no cases were reported.

In May, 1907, a sporadic case was reported at the marine hospital, which resulted fatally. The outbreak proper began in August, 1907, and continued in the city of San Francisco until January, 1908. During this period, 159 human cases occurred. During the same period, 15 cases occurred in Oakland, one in Berkeley and one in Point Richmond. During the period from 1908 until the present time cases have occurred as follows in the counties outside of the cities above mentioned:

Contra Costa County	4 cases
Alameda County	2 cases
Los Angeles County	1 case
Santa Benito County	2 cases
Santa Clara County	1 case
San Joaquin County	1 case
Total number of cases	187

The last human case of plague to occur in California sickened at Walnut Creek, Contra Costa County, in May, 1914, and made an uneventful recovery. This case was mild and atypical in type.

During the period August, 1907, until October, 1908, 398 plague infected rats were found in the city of San Francisco, and from September, 1907, to December 1, 1908, 125 plague infected rats were found in the city of Oakland.

In August, 1908, the discovery was made that plague existed among the ground squirrels which have heretofore so plentifully infested the lands comprised in the rural districts of California. Since that time, a total of 1,957 plague infected squirrels have been found, scattered over an area of approximately 13,000 square miles, which comprises the counties of Contra Costa, Alameda, San Joaquin, Stanislaus, Santa Clara, Santa Cruz, Monterey, San Benito and Merced.

From August, 1908, until the beginning of 1912, the efforts of the United States Public Health Service and the California State Board of Health, acting in cooperation, were directed towards outlining or delimiting the area in which plague infection existed. For this purpose hunting operations were conducted all over the State of California, and in portions of Oregon, Nevada and Arizona. No infection was found in any part of California except in the nine counties mentioned above, nor was infection found in any of the other states referred to.

As soon as it was definitely known that plague infection was confined to the nine counties of central California, operations were discontinued in the other portions of the State, and, since 1912, a consistent effort has been made to bring about as complete a destruction of ground squirrels as possible, in order to insure the elimination of the disease.

For about a year, though steady progress was made, and fair work was done, results of a satisfactory nature could not be obtained on account of the fact that the funds of the State were very low, and adequate legislation did not exist. On August 12, 1913, the present contagious disease act became effective, the same having been passed by the legislature and approved by the governor on June 7, 1913. This act provided sufficient funds and adequate legislation. Since that time, the work has progressed in a very satisfactory manner and it is now believed that the desired result has been accomplished.

Plague infection has been found among ground squirrels over a total of 140,000 acres. In order to insure its complete eradication, it has been necessary to destroy squirrels not only upon the infected and immediately adjoining land, but to effectively diminish the number of squirrels in the balance of the infected counties, as well. Recognizing this fact, the State Board of Health passed a resolution declaring that the nine infected counties constituted an existing focus of contagious or infectious disease. In this manner, the contagious disease act was made applicable over the entire infected area.

Since July 1, 1913, a total of 3,100,000 acres has been treated, and squirrels have been diminished by about 90 or 95 per cent. On the actually infected and immediately adjoining land, a much higher percentage of squirrel destruction has been obtained, squirrels having been reduced to the point that hunters must cover twenty-six acres of land in order to obtain one squirrel. As the hunters are able to shoot about 15 per cent of the squirrels they see, the average infestation now is one squirrel to four acres, whereas, prior to the institution of squirrel destruction measures, the average infestation on the infected and adjoining property probably was about 10 or 15 squirrels to the acre. In some portions infestation averaged as high as 50 or 60 to the acre, and in one instance averaged 140 to the acre, over an area of 12,000 acres.

During the year 1914, plague has been found in California as follows:

Human cases (one) occurred at Walnut Creek, Contra Costa County; recovered.

Rat cases (none).

Squirrel cases (69) located as given below:

San Benito County—two foci. *First focus*—two adjoining ranches, three infected squirrels; *second focus*—one ranch, eight infected squirrels.

Monterey County—one focus, one ranch, one infected squirrel.

Contra Costa County—three foci. *First focus*—two ranches, five infected squirrels; *second focus*—one ranch, one infected squirrel; *third focus*—twelve adjoining ranches, 32 infected squirrels.

Alameda County—one focus, two adjoining ranches, 19 infected squirrels.

Total—7 foci, 21 ranches, 69 infected squirrels.

All of the above ranches have been thoroughly treated, and hunted over in a most intensive manner, from three to five times, with the result that on only one ranch was a plague squirrel found after eradication measures were thought to be completed. In this instance, the disease could not have spread, as so few squirrels were left on the ranch that a hunter was able to obtain only one additional squirrel. The area of the ranch is about 700 acres.

To illustrate the manner in which plague infection has diminished during the last three years, the following hunting data are given:

Hunting season	Ranches hunted over	Squirrels shot	Infected ranches	Infected squirrels	Percentage of infection
1912	1,727	29,144	86	902	3.00
1913	1,839	22,464	68	419	1.86
1914	2,566	22,990	21	69	0.30

As previously stated, since the discovery of plague among ground squirrels, in August, 1908, its presence has been demonstrated on 258 ranches. All of these ranches, and all ranches adjoining for some distance around, have been so thoroughly treated that squirrels are, to all practical purposes, eradicated. In addition, hunting was done in the following manner to make sure that no plague infection remained:

1. All ranches on which plague was found in 1914 have been hunted from three to five times, with intervals between the hunting operations.
2. All ranches on which plague was found in 1913, but not in 1914, were treated and hunted over from two to four times, with intervals between operations.
3. All ranches on which plague was found in 1912, or previous years, but not in 1913 or 1914, were hunted over from one to three times, as conditions indicated, with intervals between operations.

In 1912, in order to learn whether it was possible to eradicate squirrels to the point that plague could no longer exist among them, the Altamont district of Alameda County, comprising 23,000 acres which had an infection at times as high as 10 per cent of squirrels shot, was so thoroughly treated that about 90 per cent of the squirrels in that locality were destroyed. After the completion of these operations, hunters were stationed there. These hunters have sent squirrels to the laboratory continuously for two years, without a single infected squirrel being found. From this experience, therefore, and from other experiences similar in all respects, except for the length of time involved, it is believed that squirrels can be so reduced in number as to cause the disappearance of plague.

From all that has preceded, the following facts may be elicited:

1. Ground squirrels can be so reduced in numbers that plague can not be discovered among them.
2. Squirrels have been reduced 90 per cent over an area of 3,100,000 acres.
3. Squirrels have been, to all practical purposes, eradicated from an area of 250,000 acres, which comprised all infected ranches and the ranches immediately surrounding or adjoining.
4. After the completion of squirrel extermination operations on infected land, in only one instance has hunting of the most intensive character revealed the presence of plague among the few squirrels that had escaped destruction.

In view of the facts just set forth, it is believed that the statement can safely be made that all discoverable plague has been eradicated from the State of California, and that danger of its further spread has been removed.

Observation over all of the infected counties will still be maintained, and vigorous efforts continued, to make the destruction of squirrels as complete as possible. Hunting will again be resumed with the opening of the next breeding season, and if no infection is then discovered, the statement can be made with certainty that no plague exists in the State of California.

As a result of the work that has been accomplished in the destruction of ground squirrels in the State of California, economic benefits have accrued to land owners far beyond the expectations of any of those who have been in any way interested in the work. A number of circulars have been sent broadcast over the counties in which infection had heretofore existed, with the request that land holders indicate the benefits that have accrued to them as a result of squirrel destruction. Sufficient time has not yet elapsed to be able to make any definite statement in this regard, but out of about 250 replies that have been received, it is noted that farmers have received, in increased crops, in conservation of pasturage, and in reduction of expenditures for repairs to irrigation ditches, canal banks, etc., amounts varying from 100 per cent to 1,000 per cent of the amounts expended for the destruction of squirrels that infested their lands.

Still further, the conduct of the present campaign for the eradication of bubonic plague and the destruction of ground squirrels has constituted a new departure in sanitation, in that 25 per cent of the expense incurred returns to the State. In accordance with the contagious disease act, if an owner of squirrel-infested land, after receiving a legal notice to destroy squirrels on his land, fails, refuses or neglects to comply with the same, the State proceeds to do the work and charge the cost of the same against the land. If the bill is not paid when presented, a lien is eventually filed against the land, and it is sold to pay the amount of the lien, and the costs. So far, no land has had to be sold. In the majority of instances, bills rendered have been paid without question, or the statement has been made that reimbursement would be made in the course of a short time. In the end, it is estimated that the State of California will receive, in the form of reimbursements, approximately 25 per cent of the amount that has been expended by the State during the past year for plague eradication and squirrel destruction.

It is estimated that since July 1, 1913, 20,150,000 squirrels have been destroyed. The average cost of labor and material, per acre, has been 17.4 cents.

Farmers, ranchers and land owners generally; are enthusiastic as to the benefits received, and have brought and are bringing pressure to bear upon their boards of supervisors to insure the continuance of the work—for economic reasons—until ground squirrels are ultimately destroyed.

Dr. George E. Tucker, Riverside, told of the destruction of squirrels in his county and the work which the supervisors have done.

Dr. William Simpson, Santa Clara County: I move that the dues in this association be the annual sum of $1.00 to be used by our secretary in defraying the necessary expense of stamps, etc.

The motion being seconded by Harold F. Gray, it was carried unanimously.

CHAIRMAN: Dr. L. R. Willson, health officer of Fresno, will now read his paper on "Malaria in California and its Control."

MALARIA IN CALIFORNIA AND ITS CONTROL.

Dr. L. R. Willson, Fresno: The subject itself assumes two things; first, that malaria exists in California, and second, that it is controllable. The purpose of this paper, therefore, will not be to discuss the cause of malaria, the plasmodium and its morphology, nor the treatment of the disease, but locating to some degree the areas infected by malaria, try, if possible, to arouse some person or some number of persons to such an extent that some means may be brought forth to control and possibly eliminate malaria from California.

Locations.

Dr. Sawyer informs me that statistics concerning Malaria are not as complete as might be and I will quote from a report of Dr. Wm. F. Snow, late secretary of California State Board of Health. He states —in 1910, 66 per cent of all deaths from malaria occur in a chain of ten counties lying along the base of the Sierra Nevada Mountains, these ten counties being Shasta, Tehama, Butte, Yuba, Placer, Sacramento, Amador, San Joaquin, Fresno and Kern. In these counties the average death rate from malaria in 1909 was one to 4,400 people. A second group of ten counties, Trinity, Sutter, Yolo, Napa, Contra Costa, Calaveras, Stanislaus, Merced, Tulare and Kings, shows one death to 15,820 population. A third group of ten counties forming a chain along the coast, San Francisco, San Mateo, Alameda, Santa Cruz, San Benito, Monterey, San Luis Obispo, Santa Barbara and Los Angeles, shows one death to each 57,614 population.

Excluding San Francisco and Los Angeles counties, two thirds of the population of California live in counties which contribute practically all of the deaths from malaria, and three counties with only about one sixth the population of the State, contribute one third the deaths from malaria, these counties being Butte with 15 per cent, Sacramento 10 per cent, San Joaquin 9.8 per cent.

Nine counties in the valleys of the Sacramento and the San Joaquin, namely, Placer, Sacramento, San Joaquin, Butte, Tehama, Shasta, Fresno, Tulare and Kern contribute 60.6 per cent of the deaths from malaria in the entire state.

Dr. Sawyer also informs me that the statistics have not changed very materially since these figures were compiled. In 1909 there were 112 deaths from malaria in California, 104 being in the northern and the central parts of the State and eight in Southern California. A mortality of approximately 2 per cent will give 5,000 or 6,000 cases of acute malaria each year.

From an economical standpoint or a standpoint of dollars and cents, I will take the liberty of again quoting Dr. Snow.

Death of 112 citizens at $1,700 average economic value	$190,400
Six thousand acute cases of malaria at average of $20 per year for drugs, etc.	120,000
Six thousand citizens' earning power reduced 25 per cent by malaria, average income $800	1,200,000
Loss of life, wages, illness from other diseases because of lowered vitality brought about by malaria, estimating 50 deaths at $1,700 each and 1,000 persons ill at $100 each	185,000
Loss of 250 families because of moving from malarial districts at $500 each	125,000
Loss of $1 per acre depreciation of value on 1,000,000 acres under irrigation in San Joaquin Valley and Sacramento Valley	1,000,000
Or a grand total of	$2,820,000

Loss each year to the people of California from malaria, a disease that can be controlled and to a large measure stamped out. But first, How? and second, When? The answer to the first is easy. Eliminate the mosquito, the anapheles in particular, and the task is accomplished. But again confronts us the question, How to eliminate the mosquito?

With the abundance of water from irrigation in the Sacramento and San Joaquin valleys, the excess and overflow into the lowlands and sloughs, the mosquito has an ideal home and certainly takes advantage of the kindness of man in being such a good provider. Some means must be evolved to destroy these ideal breeding places and when once destroyed, every endeavor exercised to keep them under control.

To destroy breeding places. First, by drainage of swamps, sloughs and lowlands, or filling in to eliminate the stagnant water. This has been done and most effectually in the Panama region. Drainage does not mean to drain the undersoil, but to drain the pools and stangant ponds, of ten times effectually done by open ditches with sufficient fall to empty themselves as well as the pool. Where fall enough is not obtainable, these pools may often times be connected with streams where fish abound as the fish is one of the best natural enemies of the mosquito. Constant inspection of the edges of ditches and pools is necessary to keep down rank growth of vegetation and allow the fish access to the edges of the water.

A larvicide has been employed in Panama with excellent results, made as follows, 150 gallons carbolic acid is heated to 212 degrees F., to which is slowly added 150 pounds powdered resin, keeping temperature to 212 degrees F., add thirty pounds of caustic soda and boil until a dark emulsion is formed, constantly stirring the mixture. It is claimed that one part of this emulsion to 10,000 parts of water will kill the anapheles larvae in less than one half hour. This mixture may be used in one part to five as a spray along the banks of streams and pools and if five parts of crude petroleum is added, it will aid in spreading over the surface of the water.

Second. Where it is impossible to drain, oil may be floated over the surface, and, as the little "wiggler" is an air breather, he can not survive under a layer of oil, and the oil must cover the entire surface of the water and repeated sometimes three or four times, especially if there be a wind blowing strongly across the surface. On a smaller scale and in cities and around rural homes, all places where water may accumulate must be destroyed. All barrels, cans, pails, old wells, cesspools, etc., where even a cupful of water stands for some time, may be the breeding place for mosquitoes and I do not believe the anapheles is very particular just where or in what kind of a place he makes his home.

As a prophylactic measure until these things may be accomplished, first, screening of houses should be insisted upon. Probably a screen of twenty strain or nineteen meshes per inch will keep out most mosquitoes. And by proper screening, we mean screening in such a manner as to keep out all mosquitoes. Where the Anapheles mosquito is to be found abundantly, an extra netting over the bed may become necessary. *Intelligent* screening against the mosquito is of vast importance but unintelligent screening is of no consequence.

The second great measure in prophylaxis is quinine administration. To be effective, quinine must be continued all during the malarial season. In the Panama region from three to six grains per day are given, increased to eight and ten grains if the prevalence indicates such doses.

Objection to quinine prophylaxis has been raised upon the grounds that the plasmodium becomes accustomed to the quinine after continued doses and if the individual later is attacked by malaria, he does not seem to react to quinine readily.

Having in a somewhat hurried and rambling manner endeavored to describe methods of malarial suppression and control, we are confronted with the real vital question in California, "How is this to be accomplished?" and "When?"

A number of "antimosquito" organizations have been formed and excellent work done at a very low cost. But has this been enough? Are we to be satisfied with a little done here and there? Can not public sentiment be aroused to such an extent that definite plans may be worked out by our excellent State Board of Health and their efficient corps of officers, legislation enacted, appropriations demanded and a thorough state-wide campaign inaugurated to suppress the mosquito and thereby eliminate from California this disease which can be controlled and which costs many millions of dollars each year and jeopardizes the lives of many innocent people.

Harold F. Gray related his experiences, under the supervision of Professor Herms, in the mosquito campaign at Penryn and Oroville.

CHAIRMAN: The next number on the program will be Professor Hyde's paper on "The Disposal of Municipal Waste."

THE DISPOSAL OF MUNICIPAL WASTE.

Prof. Hyde:

I. INTRODUCTION.

Nature of present report.

The committee realizes that most of the data and suggestions which have heretofore been made with respect to refuse disposal are applicable only to the larger and richer communities. It is to be recognized that the problem is often presented in an acute form to very small communities, especially those surrounded by other urban or suburban areas or by intensively cultivated territory. We have therefore attempted to the best of our ability to outline reasonable methods of disposal which are as cheap as is possible consistent with satisfactory results. In most cases it has been attempted to define herein the applicability of the various methods considered and the ruling conditions which must be fulfilled to achieve really good results or such results as may reasonably be expected from the nature of any method in question. As stated elsewhere, refuse collection and disposal, at the best, is expensive; but it can not be considered a luxury; the necessary cost must be faced in the light that it provides for a necessity.

General nature of municipal refuse problem.

The municipal wastes problem, including both refuse and sewage, is unquestionably one of the most complex and difficult which any community is required to solve. Like the protection against fires, the protection of life and property and the conservation of the public health, it is one which always requires a relatively large outlay with the important but more or less intangible return of comfort, convenience and safety; of those things which make for public and individual happiness rather than the more tangible but more sordid return of dollars and cents in the city treasury. In other words, if our municipalities are to expect efficient and satisfactory results in this field of public enterprise they must expect to pay for them, and dearly. These statements seem to be particularly true in California where municipal wastes, in general, are of a nature difficult of treatment and at the same time relatively destitute of valuable elements. Our generally warm climate aids, rather than retards, the decomposition of unstable materials and increases the tendency toward nuisances due to odors.

The municipal wastes problem is one of economics, in that its proper solution must involve considerable inroads upon the treasury; it is one of engineering in so far as relates to methods of collection and disposal involving transportation, destruction by heat, utilization of by-products and the design and erection of structures necessary to the conduct of some particular manner or process of disposal; it is one of public and private hygiene in so far as it removes filthy, putrescible and sometimes infected materials from houses, streets and municipal environs; it is one of æsthetics in that the processes involved and the results achieved must not be offensive to sight or smell; it is at all times one related to the comfort and convenience of individuals and the public at large.

It is possibly true that in no other field of municipal activity has there been developed on the one hand so indefinite and non-constructive public opinion and on the other hand so little of crystallized ideas of proper procedure under various governing conditions. These governing conditions involve climatic influences, size of community, density of population, character of populations and the things which are by them considered as refuse, and the environmental features of bodies of water, sparsely inhabited areas, etc. On account of this diversity of conditions, it is probable that no single method of collection and disposal of wastes will ever be developed. On the other hand various more or less successful and satisfactory, more or less expensive methods may be used. It is apparent that the problem of disposal of wastes must, for the small community with sparsely settled environs, be quite different from that of the metropolitan area with congested populations extending over large areas and having different habits of life and consequently more complex and different kinds of wastes.

Many of the essential details of refuse treatment lie within the field of the trained engineer and should be so understood by our city administrators. If, in general, any fundamental mistake has been made in America it is that of permitting the layman and inexperienced officer to determine methods, processes and works for refuse treatment and disposal.

Municipal wastes are always unsightly. Municipal tidiness is an expensive luxury. According to the value set upon this feature will be determined, in a large measure, the manner in which small communities will be content to dispose of that portion of their wastes which may be classified as rubbish.

Nomenclature.

In order that there may be a clear comprehension of the terms which will be used in this report, it is desirable that certain words herein employed be defined.

Wastes or refuse will include all of the materials contributed by a community to collectors for disposal. They will comprehend garbage, rubbish, ashes, street sweepings, night soil and, perhaps, dead animals. In the largest sense, not here considered, they may include sewage.

Garbage may be defined as the refuse from kitchens, meat, fruit and vegetable markets and perhaps, in some cases, from abbatoirs. The refuse of abattoirs and meat markets, when separately considered, may be classed as offal.

Rubbish includes practically everything which is not comprehended in the other classes. It may consist of paper, leather, cloth, earthenware and metal articles of every sort. The heterogeneous character of this portion of a city's refuse actually beggars description.

Ashes, as the name implies, are the refuse of household and industrial furnaces, grates, fireplaces, etc., as the case may be.

Street sweepings represent the litter gathered from streets. In some cases, from paved areas, they may be largely organic and may consist mainly of manure. In other cases, from improved streets, or paved areas adjacent to large building operations, the street sweepings may consist largely of mineral matters; sand, dust and dirt, with only a moderate amount of manure.

Night soil may be considered to be the semi-fluid or liquid wastes from privy vaults and cesspools.

Dead animals usually embrace horses and household pets such as dogs, cats, rabbits, etc.

Incineration may, for present purposes, be defined as the destruction of, generally speaking, mixed refuse by rapid burning at uniformly high temperatures, say 1300° F. or over, with the consequent complete destruction of organic matter and the odors resulting therefrom and the production of a certain amount, sometimes very small, of hard clinker comprised of partly or wholly vitrified materials.

Cremation may, for the present, be defined as the destruction of, generally, mixed refuse by comparatively slow burning at relatively low temperatures, perhaps usually below 1000° F.

II. THE COLLECTION OF MUNICIPAL REFUSE.

Frequency of collection.

The required frequency of collection depends primarily upon two factors: (1) the character of the refuse and (2) the climatic (temperature) conditions.

With separate collection of garbage and offal, collections should be made every second day.

The collection of mixed refuse from average households should, under California conditions, be made twice a week during the period March to October and perhaps only once a week during the winter months, November to February. On account of the difficulty of providing storage, large hotels, apartment houses, hospitals and markets should have a daily service.

Separation of materials.

Whether or not the municipal wastes shall be collected in separate classes depends upon the method adopted for disposal. For instance, the disposal of garbage by feeding to swine requires not only that clean garbage free from other matters be collected, but that this garbage be removed frequently in a fresh condition. The disposal of garbage by reduction also implies a separate collection of this element of municipal wastes. The disposal of ashes as filling requires that this item be separately collected. The treatment of refuse by cremation, incineration, burying in land, or dumping at sea permits a general collection of the mixed wastes of the city, including, in some cases, dead animals and street sweepings, as well as ashes and even night soil when not too liquid.

Municipal vs. private collection.

There are certain reasons for believing that a general municipal collection of refuse, either mixed or in classes, as the case may be, represents the ideal procedure toward which every municipality should strive. Indeed, it would appear that the collection of refuse is as much a municipal function as is street sweeping, fire and police protection, etc. The advantages of this system would naturally be that the manner, times and vehicles may be better controlled, the service will naturally be extended to all people alike, the routes can be systematically mapped out, the charge may be made on some uniform and equitable basis or else the service may be had free of direct costs and finally the tendency to dispose of refuse independently by dumping on vacant lots, in alleys, or other promiscuous places should thereby be reduced to a minimum. With unbusiness-like methods or actually dishonest manipulation and the operation of rules of political patronage rather than civil service principles, the service might be both expensive and unsatisfactory.

When garbage is collected for feeding to hogs it is customary for the owner of the hog farm to make his own collection. In such case the other classes of refuse will require to be collected under other arrangements.

Small cities, operating under effective ordinances, may make satisfactory arrangements for refuse collection under contract or licensed collectors may be permitted to give service to individual householders being paid directly by them.

Contracts for garbage collection are, of course, possible with communities of all sizes, but the satisfaction of such procedure will depend upon local conditions.

Storing on premises.

For the storing of mixed refuse or garbage on the premises of householders, water-tight galvanized iron cans with water-tight metal covers must be used. Preferably the covers should be attached to the cans so that they may not readily be displaced. They should be fly, rat, dog and cat proof. The householder should be expected to wash the cans frequently and occasionally to treat them with chloride of lime solution as a deodorizer and disinfectant.

Ashes, when significant in amount, and if separately collected, should be stored in metal containers in order to reduce the fire hazard which is really great if wooden receptacles are employed.

III. THE TREATMENT AND DISPOSAL OF REFUSE.

General remarks.

The problem of refuse treatment and disposal must be considered both with reference to the separate classes of materials and the mixed products. This plan will be pursued in the discussion herewith and the following items will be considered: (1) Garbage, (2) rubbish, (3) ashes, (4) street sweepings, (5) manure, (6) night soil, (7) dead animals, (8) mixed refuse. In the succeeding discussion only those methods which would seem to be reasonably applicable to each class of refuse are considered.

(1) Garbage.

(*a*) *Burying in Land.* Garbage may properly be buried in land and for small isolated towns, where lands available for the purpose can be had, this method of disposal represents the cheapest one which can be found. The ground should preferably be of a porous nature. The work of burial must be performed properly. One suitable method is to excavate a trench in advance of the filling, using Fresno scrapers, which will take the soil out of the excavation and use it for covering the garbage with an adequate layer of earth. The lands upon which garbage is so disposed by burial should be owned by the community and in sufficient area.

(*b*) *Plowing under Land.* As compared with the method of burial, this plan of disposal requires very large areas. It must be done by farmers, preferably under long-term contracts. It is only applicable to small places, perhaps those having less than 2,000 inhabitants. Wet weather brings special difficulties and unless the soil is extremely sandy it renders the method uncertain and possibly impracticable. The only defense of this method of disposal which can be made in comparison with others rests with the fact that the garbage has some fertilizing value, containing as it does more or less nitrogen and being capable of furnishing humus to soils lacking in this feature, as very sandy soils would be apt to be.

(*c*) *Feeding to Hogs.* This method of garbage disposal is applicable to public institutions in country districts and to small, isolated towns. When so disposed of, the garbage must be collected daily and must be fresh. It should be disinfected by cooking in some cases. The piggery must be provided with concrete floors, feeding troughs and storage bins. It must be arranged with a view to its proper cleansing and it must be kept clean. The hogs should be corraled in small groups and special precautions must be taken to prevent diseases. It is probable that the feeding with garbage should be supplemented with grain or other food in order to improve the quality of the flesh. It is understood that difficulties are sometimes encountered in disposing of garbage-fed hogs. While it must be admitted that most piggeries have proved to be local nuisances, this condition need not necessarily exist. One of the writers has visited the famous Whipple farm at New Boston, New Hampshire, where a piggery containing fully 1,200 hogs fed with garbage from the Youngs Hotel, Parker House and Hotel Touraine in Boston (all operated by the late Mr. Whipple) is maintained without the slightest nuisance. The hogs here were in fine condition and the premises were clean and comparable with modern sanitary dairies.

(*d*) *Reduction or Utilization.* The process, generally known as reduction, is sometimes applicable to city garbages when sufficient volumes of suitable quality are available. This process comprises the treatment of the garbage to extract the grease and the subsequent utilization of the tankage or residue to serve as a filler for high-grade commercial fertilizers. This method is justifiable on economic grounds, the sale of grease and tankage being expected to meet the cost of treatment and provide some net revenue. In a number of places in the United States the operation of reduction works seems to be reasonably profitable if the cost of collection be not considered as a part of the cost of disposal. The method is applicable only to cities of large size. There are but three cities in California at the present time which are sufficiently large to permit this process to be considered in relation thereto, and with these, on account of the probable low grease content of California garbages, the successful application must be regarded as quite problematical. California garbages, especially during the fruit season, contain excessive amounts of moisture. This of course increases the weight of material requiring treatment with respect to the amount of grease which is available.

Progress is being made in the construction of the so-called reduction plant being built by C. D. Crouch, of Chicago, for treating the garbage of Los Angeles. There it is understood that grease will not be extracted, but the garbage will be cooked, dried and macerated and placed upon the market as a commercial hog food.

While it is true that the disposal of the garbage removes the most objectionable portion of municipal refuse, it is to be remembered that there still remains the greater bulk in the shape of rubbish and other wastes which require some satisfactory manner of disposal.

(2) Rubbish.

(*a*) *Burning.* In rare instances, furnaces for the destruction of combustible rubbish with the production of steam have been installed. The committee knows of no city in California, except perhaps at Los Angeles as an auxiliary to the reduction works above referred to, where this method would be applicable. It is a matter worthy of comment that the rubbish of certain California cities, notably Berkeley, is singularly deficient in combustible material.

(*b*) *Dumping on Land.* The disposal of rubbish by dumping on land, with attendant slow burning, should certainly not be permitted in thickly settled districts. There are some few instances where it may with propriety be permitted, but it must be remembered that rubbish is always ill-looking and this method of disposal is generally objectionable on aesthetic grounds. Dumps should not be allowed near traveled roads nor in the channels of small streams where high water will carry the materials farther down and cause them to be promiscuously stranded on stream banks and over low-lying lands. This method of disposal will be further considered in connection with the disposal of mixed refuse.

Ashes.

(*a*) *Disposal as a Filling Material.* Ashes make excellent filling material and should, in California, be disposed of in this manner in proper locations. It is to be noted that with the general use of gas, oil, and electricity for cooking, and oftentimes for heating, in private houses, and the general employment of oil for steam making and other heating purposes in industrial plants, the amount of ashes contributed by, and requiring disposal from, California cities is relatively very small indeed.

(*b*) *Disposal with Mixed Refuse.* Where mixed refuse is disposed of by some particular means, such as will later be discussed, the small amount of ashes produced in a community may very properly be collected and disposed of in conjunction with other wastes.

Street sweepings.

(*a*) *Disposal as Fertilizer.* Street sweepings from paved areas have a considerable fertilizing value. They should be composted at suitable places, and, when well decomposed, should be used on city parks and gardens or upon adjacent farms. Compost heaps of street sweepings do not, as a rule, breed flies.

(*b*) *Disposal with Mixed Refuse.* Street sweepings may, in some cases, be best disposed of by mixing with other city refuse.

Manure.

(*a*) *Disposal as a Fertilizer and with Mixed Refuse.* The same considerations which apply to street sweepings would also logically apply to the disposal of manure.

Night soil.

(*a*) *Burying or Plowing in Land.* As a rule, night soil should be removed by so-called odorless excavator apparatus and carried to suitable cultivated lands, where it should be disposed of as a fertilizer by burying or plowing under. Vegetables which may be eaten raw should not be raised on such lands for a considerable interval after treatment with these wastes.

Dead animals.

(*a*) *Disposal by Rendering.* All portions of the larger animals have a value and may be disposed of by rendering. Rendering establishments require to be located in isolated places. They should be conducted in a clean manner under the same sorts of regulations as would apply to abattoirs.

(*b*) *Disposal by Cremation or Incineration.* Arrangements are made in certain incinerators and crematories whereby the carcasses of dead animals, even horses and cattle, may, in limited numbers, be destroyed by burning with mixed refuse.

(*c*) *Disposal by Burying.* In very small communities the logical method of disposal of dead animals is by burying in suitable places at proper depths below the ground surface.

Mixed refuse.

(*a*) *Dumping on Land.* The disposal of mixed refuse by dumping on land, or, as the English term it, by tipping, is naturally the cheapest, but also the most offensive method which can be devised. In rare instances, in isolated, small communities, this method can be adopted without producing a nuisance, provided the dump is sufficiently removed from habitations and from traveled roadways. When utilized, the dump should be surrounded by a thick screen of trees placed closely together in several rows. The land should be owned by the municipality in sufficient area. Loose papers may, and perhaps should, be burned, and, if prevailing winds are such that odors will not be conveyed to neighboring populations, the entire mass of combustible material may be subjected to slow burning.

(*b*) *Burying in Land.* Under certain ruling conditions, herein outlined, mixed refuse may properly be disposed of by burying in land. The method is applicable to the smaller communities where outlying land is available in sparsely settled neighborhoods. To obtain satisfactory results, the soil should be sandy and the least depth to ground water should be six feet. The area secured for the purpose should be ample and should be owned by the community. The work of burial must be properly performed. As stated above, with respect to the burial of garbage, one apparently satisfactory method is to excavate fairly deep trenches with Fresno scrapers which will remove the soil from the excavation and later replace it in suitable depth, perhaps 18 inches, over the refuse. If this procedure is carried out systematically, odors will be reduced to low terms and extreme unsightliness will be avoided. The disposal area should, of course, be carefully selected and, as suggested above, it would be wise to surround the tract with a thick screen of trees closely planted in several rows. A suitable roadway should be built to the area so that teams may travel thereto under all climatic conditions.

Some idea of the amount of land required for the disposal of mixed refuse may be obtained as follows: It may be assumed that a cubic yard of refuse weighs 800 pounds, and that 300 tons will be contributed per annum by 1,000 persons. The volume of this refuse might be 750 cubic yards. A trench 20 feet wide, 6 feet deep and about 170 feet long would be filled in one year by the refuse of 1,000 persons. Over the top of this deposit a part of the earth taken from the excavation must be placed; the surplus may be disposed of in spoil tanks or otherwise. Gradually the refuse will decompose and will reduce to perhaps 50 per cent of its original bulk.

(*c*) *Dumping at Sea.* The dumping of mixed refuse at sea is applicable to certain of the larger cities in California. Like all other primarily engineering projects it should be very carefully investigated prior to adoption. The preliminary studies should consider the direction and velocity of currents and the effect of wind and tide. The use of adjacent beaches may become a factor if, on occasion, material may be stranded on the shores, or, due to accident, the distance from shore at which the refuse is dumped is not properly gauged. The method is today being employed with thorough-going success by one metropolitan area in California. For large communities where the ruling conditions, as above recited, prove to be satisfactory, this method of disposal is one of the most rational and certainly the cheapest which can be devised. In the case of Oakland, Piedmont, Emeryville, and Berkeley, which have joined their interests in this matter, it is probable that the costs may be materially reduced if the boat and other appurtenances were municipally owned and operated, and if better loading and dumping arrangements were developed. One element which requires consideration and which tends to make the costs of such disposal prohibitive for the smaller individual communities is the weather hazard necessitating the use of large, sea-worthy craft which can be taken out to sea under all conditions. In some cases the length of haul necessary to convey the refuse to a point from which it can not return to the shore, at any rate to inhabited shores, might be an insuperable obstacle from the cost standpoint.

Incineration.

(*d*) *Applicability.* Incinerators are ordinarily adapted only to the treatment of the mixed general refuse of the larger communities. Cities determining upon the use of this method of refuse treatment must be willing to meet the cost thereof. These costs, per unit weight or volume, can not be small for small communities or for larger communities where the plant can not be operated at somewhere near its rated capacity. It must be remembered that interest, depreciation and maintenance charges are just as much a part of the cost as are the items of labor and supplies, such as additional fuel, if such be required.

The mixed refuse of California cities is a very different article from that of other portions of the United States, particularly the northeastern portion, where the major part of our experience with incineration in America has been had. In some of our cities the amount of combustible in mixed refuse is reduced to the lowest possible terms, there being almost no wood, a minimum of paper and cardboard and but few ashes, and these almost devoid of unconsumed combustible material, so that they retard, rather than aid, the burning process. During the fruit season the additional moisture in the refuse becomes a factor of great concern. A very distinct difference in the percentage of combustible materials and the water must, in California, exist between the refuse of the greater commercial and industrial cities and cities of almost equivalent population, but largely residential in their nature.

Necessary Temperatures. The successful operation of an incinerator, as here defined, demands high temperatures. High temperatures are an anomaly with slow combustion; rapid combustion is the absolute criterion of temperature. This committee regards 1,300° F. as the lowest general temperature necessary to destroy odors and offensive gases and produce, in greater or less amount, a vitrified product, called clinker. The usual temperatures in the combustion chamber of a successful incinerator should range between 1.600° and 2.000° F.

Location. The claims of incinerator builders to the contrary notwithstanding. the location of incinerators should be most carefully chosen. Where cities are laid out in accordance with the zone system, the incinerator should undoubtedly be located in the factory districts. In any event, they should be as far removed from residence districts as possible. Finnicky people, especially, are to be avoided. Due regard should be paid to the direction of prevailing winds, and the incinerator should not, if it be possible to do otherwise, be so located that chimney gases and possible dust may be swept by the winds over the more thickly populated areas.

Essential Elements. The committee regards the following elements as essential in any modern incinerator plant: (*a*) At least three units, and preferably four, in order that the temperatures in the combustion chamber may be maintained uniform and uniformly high; (*b*) a high chimney of ample proportions to diffuse gases to the upper air and to aid in maintaining draught; (*c*) a forced draught of air, preheated to the highest possible temperature; (*d*) an ample combustion chamber through which all gases from the several cells shall pass and mingle and in which the obnoxious fumes shall be destroyed.

Operating Elements. The operating elements may be simple or complex, may be designed to give the greatest comfort to the operators or but little. These elements are undoubtedly important as affecting first cost as well as the cost of maintenance and operation. Mechanical or manual methods of charging, clinkering and removing ashes may be employed, both successfully, the determination as to their use depending upon the size of the plant, the necessity of reducing operating costs, etc.

Utilization of By-Products. Whether or not it should be attempted to produce steam for commercial or other municipal uses, or even for the purpose of operating the mechanism of the plant, must be determined by many factors, principal among which are the size of the plant, the character and amount of refuse and the market for the steam.

For the conditions prevailing in California your committee feels that it is economically unjustifiable to attempt to utilize the clinker or such products as might be obtained by sorting, even of the roughest kind. Such utilization will ordinarily be more bother and cause more nuisance than it is worth.

Disposal of Ashes. The volume of ash which will be returned from a California incinerator must be expected to be relatively very large, owing to our peculiar local habits. The disposal of the ashes may become a problem of no mean importance. In Berkeley, for example, it was found that 33⅓ per cent of the entire weight of refuse burned appeared in the form of thoroughly mineralized product. Of this, one half of the volume was represented by tin cans. In six months of operation, a dump covering one acre to a depth of three feet was established. It is probable that the conditions in this matter as respects Berkeley will be found to be true of other typical Californian communities.

Determination of Temperatures. The temperature of combustion should be determined by a suitable type of pyrometer located at a representative point in the combustion chamber. The temperatures should be continuously recorded as an index of the faithful and effective operation of the plant and the probable elimination of obnoxious fumes.

Cremation.

(*e*) *Scope.* Under this head is included what is also known as the American type of furnace, which includes all those burning at a low temperature, *i. e.,* below 1000° F., at a variable rate of consumption and with charging done in relatively large amounts.

Type of Combustion. The crematory furnace varies so widely as to construction that classification is impossible, and no fixed principles can be given governing them. In this field of design American ingenuity has run riot and many hundred different patents have been issued covering every part of these furnaces and methods of their control.

Draught and Chimney. Draught is usually effected by chimney alone, whose height is usually from 50 to 100 feet, tall chimney affording not only increased draught, but more thorough diffusion of gases.

Charging. No great importance is attached to the method of charging. The most economical method is naturally that where least handling is required, and this obtains where refuse is dumped directly into the furnace from the collection wagon.

Removal of ashes is always effected by hand.

Utilization of By-Products. It is needless to say that the production of steam or other by-products is hardly possible under this method of disposal.

Number of Units. The number of units is wholly dependent upon the type of construction, some plants being constructed upon the unit system and others not.

Fuel. In practically all plants of the low temperature type, additional fuel is required beyond that afforded by the refuse collected. The method of applying this fuel may vary according to the type of plant and fuel available. The efficiency of the type of construction will govern largely the amount of fuel necessary to maintain combustion at an economic rate. It may be expected that during certain seasons of the year larger amounts of supplementary fuel will be necessary. No general statement can be made as to the amount of fuel necessary, from 100 to 300 pounds of coal, or an equivalent amount of oil per ton of garbage often being necessary. A large item of expense is likely to be encountered here and should be carefully considered before any plant is adopted.

Odors. The creation of large amounts of offensive odors is certain to be formed by burning refuse at low temperatures. To remedy this various methods are adopted. What are called stench consumers are sometimes employed, whereby the smoke and fumes are caused to pass over an auxiliary grate upon which a hot coal fire is maintained. The same result, in other cases, is accomplished by the use of an oil burner. This item is of greatest importance if the location of the plant is at all critical.

Location. The location of the plant is the most important consideration of all. If it is ever advisable to locate any type of refuse destroyer near the center of population it is certainly not in the case of a plant of this type. It is to be remembered that isolation can only be secured at the expense of cost of collection.

In the selection of a site, the direction of prevailing winds, the natural trend of the growth of the city, space for deposition of ashes, tin cans and large quantities of miscellaneous incombustible material, are elements which must be most carefully considered.

Respectfully submitted,

C. G. HYDE, Chairman,
J. J. JESSUP,
S. J. VAN ORNUM,
Committee.

Discussion:

DR. WILLIAMSON, Sacramento: This excellent paper is quite exhaustive and needs but little in the way of comment.

In regard to the municipal collection of garbage, one further matter is of interest. With private collection there is often a congestion at the crematory because the arrival of wagons is not properly timed. This is an economic waste which is a further argument in favor of municipal collection. The supervision of cans at the home can also be done by the municipal collector and there is a point to be brought out in connection with the care of such cans. Garbage should be drained and the more solid portions wrapped in paper before placed in the can. This keeps the cans clean and prevents access of flies both in the can and during transfer to the wagons. Milwaukee requires this by ordinance. In our own home we have used the method for some time and find it a distinct advance.

In regard to the matter of feeding garbage to hogs, the points already noted must be emphasized; that the garbage must be fresh; it must be cooked; grain should be fed with the garbage and the feeding stopped a few weeks before slaughter, and there should be concrete troughs that are kept clean; but these conditions will seldom be met and the practice must be considered dangerous.

I recall an instance in which garbage was fed to hogs outside of Manila. Many hogs died and were found to have cirrhosis of the liver.

A few types of emergency crematories such as were found to be of use in the army might be described. They could be used if the wind were blowing in the right direction.

First.—A hole fifteen feet in diameter, three feet deep, with a rock floor one foot in depth; rock side walls to one foot above the surface of the ground, and a central cone of rocks six feet in height. The solid material could be thrown in the center and the liquids poured on the rocks around the sides.

Second.—Cross trenches six feet long with arms which slope from three inches in depth to eighteen inches deep at the junction with a grade of railroad iron in the center. This is better if lined with rocks and still better if a cylinder for a better draft is used above the grate.

Third.—A truncated cone cylinder about five feet high and five feet in bottom diameter with draft openings on four sides near the bottom and a grate.

Such emergency devices might be found to be of considerable service at times.

Dr. Stanley P. Black, Pasadena: I wish to commend the plan Dr. Williamson spoke of regarding wrapping the garbage up in paper.

Dr. George E. Tucker, Riverside, told of the excellent garbage cans used by the Riverside Cement Works.

Dr. W. A. Sawyer, State Hygienic Laboratory, spoke of the garbage cans used in San Francisco and marked "Inspected and passed by the San Francisco Health Department."

Dr. L. M. Powers, Los Angeles, spoke of the need of municipal supervision over the collection of garbage.

Dr. J. J. Benton, Berkeley, told of the disposal of Berkeley's garbage, the abandonment of the incinerator due to the high cost of maintenance and the trouble experienced with garbage collection.

Dr. Allen F. Gillihan, Oakland, called attention to the necessity for water tight garbage wagons.

Dr. Wm. C. Hassler: The department of health of San Francisco, through the chief sanitary inspector, herewith presents for your earnest consideration and adoption, the following resolution, the object of which is to conserve to the State the heifer calf, and, by so doing, encourage the raising of cattle, enabling dairies to replenish their herds from native cattle and serving as a factor to lower prices of meat food products:

Whereas, The subdividing of large tracts of land into small farms, thus changing in various portions of this State the character of the industry and products of said land, eliminating thereby in these subdivided sections of the cattle raising industry; and

Whereas, The increase of population, not only in the cities, but throughout the State generally, is thereby constantly increasing the demand for food products, particularly meat; and

Whereas, To meet this demand because of high prices offered, particularly in sections close to the large centers of population, the farmer slaughters or sells for slaughter young stock, creating a condition which if continued will in a few years practically eliminating the cattle industry from this State and work a twofold hardship, first, in that a still higher price must them be paid for meat because the State's supply must be brought from other states; and, second, the sections of the State where cattle raising is possible will be unable to supply the dairy farms with stock to replenish their herds; and

Whereas, It is not many years distant when measures must be adopted to eliminate tuberculosis from among such dairy herds:

Therefore, the time has arrived to bring about the proper legislation to encourage the raising of cattle in California so that dairy herds may be properly replenished from stock raised within the boundaries of our own State and also aid in reducing the high cost of meat food products, by prohibiting the indiscriminate slaughter of female animals of the bovine type until the same shall have reached a minimum age of two years.

Therefore be it resolved, That this convention of State, county and municipal health officers recommend to the State legislature the passing of an act prohibiting the slaughter of any heifer calf or female animal of the bovine type until said heifer calf or female animal of the bovine type has attained the age of two years.

Dr. Allen F. Gillihan: "I move that the resolution be adopted."

The motion being duly seconded by Dr. Benton, it was carried unanimously.

Dr. George E. Tucker: I move that the resolution be referred to the legislative committee of this body.

Seconded by Dr. W. J. Stone and carried.

CHAIRMAN: The meeting will stand adjourned until eight o'clock.

EIGHTH SESSION.

Thursday, October 15, 1914, 8:15 p. m.

The meeting was called to order at 8:15 p. m., Dr. Donald H. Currie, secretary, State Board of Health, presiding.

CHAIRMAN: The first thing on the program will be a paper by Dr. E. F. Glaser, member of the State Board of Health, on "Venereal Diseases as a Public Health Problem."

VENEREAL DISEASES AS A PUBLIC HEALTH PROBLEM.

Dr. Edward F. Glaser, San Francisco member of the State Board of Health: Vision into the near future finds looming large the venereal problem, not only for the pedagogue, the sociologist and the faddist to theorize about, but more especially for the health officer to solve as a health and sanitary question, and more exactly as to what can be done to prevent the spread of these virulent diseases, what will place them on the same basis as other communicable diseases and bring them under administrative control.

The aim of this paper is not to discuss the moral or social sides of the question, nor to elaborate the fact of the close relationship between prostitution and venereal diseases, but to deal with a public health problem. We are all agreed that efforts should be made through administrative action to control the spread of these infections, to check the ravages of gonorrhœa and syphilis. The Commonwealth Club Red Plague Report, 1912, states that in San Francisco one person in fifteen (men, women and children included), were treated during that year for some venereal infection by the physicians of San Francisco and that the number of cases treated in 1912 was over 10 per cent greater than the number of cases treated in 1911. From 20 to 30 per cent of all insanity and a large proportion of the feeble-minded are due to syphilis. Fifty per cent and more of sufferers from diseases of the central nervous system have been infected with syphilis. Twenty-five per cent delinquent children have venereal diseases. The blindness from opthalmia neonatorum is variously estimated by different authorities as from 25 per cent of all blindness to 80 per cent of blindness in *asylums.*

After consideration of the insane asylums, the homes for feeble-minded, the inmates of blind asylums, the inmates of relief and aid homes and the inmates of prisons, whose presence there is due to weakened moral or physical fiber, a conservative estimate would be that venereal disease costs the taxpayers of the State of California more than $2.000,000 a year.

The New York County Medical Society reports an average of one infection to every sixteenth person. These did not include the great number of cases that are treated by the sufferers with patent medicines and home cures.

Both syphilis and gonorrhœa are immense causative factors in the death rate. Of 600,000 deaths occurring annually in the United States from preventable diseases, 100,000 (*i.e.* one sixth) are due to venereal diseases and a very conservative estimate would be that for each one who dies from a venereal disease there are ten who become infected, who do not die, so it can be estimated that there are at the minimum 1,000,000 persons in the United States constantly suffering from some form of venereal disease.

Diphtheria, with its known diagnostic test, its known antitoxin treatment and the well elaborated rules and regulations, has been nearly subdued. Vaccination has conquered smallpox in that best of ways, the preventive way, and made it a rare disease. Better milk legislation, purity of water supplies, antifly campaigns, and antityphoid vaccine are reducing the number of cases of typhoid. Much good work is being done with tuberculosis, although the results show still much to be solved.

Now recent advances in medical science have given us new weapons with which to attack the venereal diseases and we are able to approach the problem with definite scientific diagnostic tests and with known tried specific treatment. But this greatest of scourges, the red plague is not legislated against, or existing laws and regulations are not enforced, save as in the case of New York City, where the excellent work done serves as a bright example.

Can we not do our part in bringing about a cleaner knowledge and control of the situation? The great thing that has continued the inertia upon the venereal problem, has been not only the relation of these diseases to prostitution and the double standard of morality, but the lack of public opinion and the fear of ridicule; and much work must of necessity be of an educational and publicity nature, to prepare the public to accept work along these lines and to respond with their appreciation and aid, so the public will expect and demand proper legislation and regulations.

This problem will not be solved by sporadic campaigns of private organizations, but by steady, systematic routine work, as for example, is being done by the tuberculosis bureaus. Sociological aspects are the apathy or indifference through ignorance and false modesty of the general public—and the apathy or indifference through fear of ridicule, or through fear of their incomes becoming affected, of many of the medical profession. The obvious remedy is educational work and publicity. The health department of the city of New York, records their realization of publicity as an educational factor of the first magnitude. So admitting the nonexistence or the inadequacy of existing facilities for the control of venereal diseases ought not we to strive for the institution and enforcement of (1st) some system of confidential notification of these diseases to a sanitary authority, (2d) some machinery that will tend to secure early diagnosis and make possible prompt, proper and adequate treatment, and (3d) also machinery to diffuse generally, by educational and publicity means, accurate knowledge concerning sex hygiene, venereal disease and related subjects. What best could accomplish this, is a matter for grave deliberation and discussion. The success in this State and other places of the bureau, for the study and prevention of tuberculosis under the State Board of Health, has led to the suggestion of a bureau for the study and prevention of venereal disease. Obvious would be the value of being under the control of the

State Board of Health with its state-wide machinery and authority. Under assured State support the routine administrative work, the prophylactic work diagnostic and educational, and the scientific research could be accomplished in a quiet and practical manner.

To consider (1st) the confidential notification and registration which will give accurate information concerning the existence and distribution of the individual cases, *i. e.*, give a basis for effective administrative action. We need not discuss the value of accurate statistics, but suggest that definite cold figures would help tear away the mysterious surrounding curtain, and that exactly compiled statistics would be of a great educational value to the public and to the professions. Without the vital statistics, no intelligent program could be formulated, and without knowledge of the number of cases no intelligent judgment could be formed as to the adequacy or inadequacy of existing regulations and facilities or of regulations and facilities to be developed in the future. But, even more important to the public than the statistical value, is the means given for insisting on and securing an early and accurate diagnosis and imparting the proper educational and preventive education. The department of health of the city of New York notes with satisfaction the gradual disappearance of opposition to the regulation requiring the confidential notification of venereal disease. The New York department has fully demonstrated the practicability of securing notifications, both from institutions and private physicians. Their figures of reports during nine months of 1913 showed 7,157 reports by institutions and 6,283 by private physicians.

In January, 1911, the California State Board of Health made gonococcus infections and syphilis reportable diseases and requested cooperation by every means available. This has brought but little response as for instance, in one year but 13 cases were reported, which illustrates that the passing of rules does not alone bring about desired results. To be effective, there must be the machinery to give publicity and popularize and also enforce the regulations. A bureau with a competent head, would soon gain the confidence and support of health officers and local boards of health and also of the physicians who would become interested and aid the bureau's intensive study of venereal disease with a view of preventing its spread. Physicians do not take kindly to clerical work, where they see no apparent use, but would gladly make confidential reports to the health authorities were it evident that in good faith such reports were being used for constructive, scientific, and preventive purposes. Now as to the second department, to provide facilities for diagnostic examinations so there would be assured for every sufferer an early and accurate diagnosis.

Recent scientific advances in medical science has given us the tests to accomplish this, and today the laboratories of the boards of health must possess facilities not only for the diagnostic tests for diphtheria, tuberculosis etc., but also for gonococcus infections and syphilis.

The state hygienic laboratory in Berkeley has been making the diagnostic tests for gonococcus infections for some time and at the beginning of this year, the State Board of Health (thereby making California the first state to do this) has made the Wasserman test for syphilis available for state institutions and for physicians for their patients to whom it would be a hardship to pay for a reliable test at a private laboratory, and who reside outside the larger cities.

Municipalities of over 20,000 inhabitants have their own boards of health and are expected to possess their own free laboratory facilities. in San Francisco, the laboratory of the San Francisco board of health is doing this work. The State may well be proud of its hygienic laboratory at Berkeley. The excellence and reliability of its work make it a standard for other laboratories and the helpful and effective atmosphere of the institution should be appreciated by every doctor throughout the State. A mailing outfit for sending serum for examination for syphilis can be obtained from the state laboratory or from the numerous stations scattered throughout the State.

To patient, physician and community, these much needed diagnostic tests represent a helpful service which, previously, the expense would have in many cases prevented, as they give to the physician an early diagnosis. They assure to the patient adequate treatment and quicker cure, thereby preventing the late manifestations of the disease, and, to the community, protection in reducing the risk of exposure of others and resulting infections.

In New York the board of health not only gathers statistics of venereal diseases and makes the diagnostic tests, but they also at stated hours at stated special clinics, supply a medical adviser who gives confidential advice. Patients are not treated but advised. Patients obviously entitled to clinic treatment are referred to one of the standard G. U. clinics. Patients able to pay a private physician, are given a list of the attending physicians of the standard G. U. clinics.

The great value of the advisory department is the protection it gives directly to the patient from ignorant self-treatment, from drug store and patent medicine treatment and more especially from the medical quack. The idea of an adviser of a local board of health of this character, *i. e.*, a physician to inform the patient of the nature, dangers and necessities for proper treatment of his disease, is being discussed and planned for in many of the larger cities. In New York it has been demonstrated that the medical advice given, in no way interferes with the legitimate work of physicians and dispensaries, but that it materially aids them in successfully treating their patients. In San Francisco the local board of health is arranging for a sign card to be exposed in the lavatories of the saloons, lodging houses and hotels, to take the place of the genito-urinary quack ads taken down by the law. On these, after the advice and caution given, it is desired to place the names of the local G. U. clinics, while patients able to pay are cautioned to consult only reputable physicians. Administrative control of venereal diseases must embrace the investigation of the clinic, dispensary and hospital facilities for these diseases. In large cities where there are as yet no special dispensaries, it would be the duty of the health authorities to provide proper facilities. In San Francisco the local board of health is encouraging one of the larger teaching institutions to conduct an evening clinic. The New York laboratory not only diagnoses gonorrhea, but on application will supply the vaccine for treatment. No administrative control of these diseases will be complete without the facilities, so that even the poorest citizen can secure the benefit of the most modern advance treatment.

Now the third province. The proper recognition of education as a powerful weapon of preventive medicine, places the educational function as perhaps the most important part of any plan to control venereal disease. A quiet, persistent campaign of vital fundamental work, is required as a practical and effective method of mitigating the suffering and reducing the economic loss due to venereal disease and protecting the unknowing or unthinking public. Curiously, as was the experience when steps were taken to inaugurate administrative control of tuberculosis, much educational work must be done among the members of the medical profession to arouse them to a full appreciation of the importance of the problem and to their individual and collective responsibilities. The socialization of preventive medicine does not mean interference with the private practitioner. It is an aid to him and the socialization of the care of the public health is not going to check but stimulate competition. Most helpful to the profession would be the object lesson of the health authorities accomplishing scientific work in gathering accurate statistics, giving free diagnostic tests and emphasizing their value, securing ample opportunities for treatment by reputable physicians, clinics and hospitals, and protecting the patient, and incidentally the practice of the medical man, from the mercenary and injurious treatment of quacks.

In the education of the general public, it is important to secure a frank discussion of the heretofore tabooed subject, to remove by simple direct teaching and timely advice the mystery of odium thrown around diseases which would have fewer victims had they but known. Much may be accomplished by lectures, articles in newspapers and magazines, and bulletins, literature and information carefully distributed. As already mentioned notification affords an opportunity for immediate educational work through cards or circulars of information or through direct personal work. There should be printed and available for distribution by physicians, clinics, hospitals and interested social organizations, cards or pamphlets or instructions to those having syphilis and those having gonorrhea. These cards should tell of the nature of the disease, its dangers to the patient and the duties of the patient in protecting others. Should warn against any treatment but that of a reputable physician or clinic and give directions for the personal hygiene of the infected person. A vigorous campaign should be instituted against advertising specialists. In San Francisco the board of health has been instrumental in removing all genito-urinary quack ads from the lavatories of saloons, lodging houses and hotels and are now formulating a card of caution and instructions to take the place of these ads. The card printed and distributed by the Oregon state board of health is considered a model for others to copy. To the New York City board of health and to the Oregon board of health, with their distribution of literature and their advisory department, much credit is due for initiating work along these lines.

It should be the duty of the proper health authorities to work not only independently, but in connection with existing educational, social medical and civic agencies, with all those forces which stand for civic betterment in public health matters. The work along these lines of the Oregon state board is greatly intensified by the educational work done by the Oregon Social Hygiene Society for whose educational and preventive work the state of Oregon appropriates $10,000 a year.

The New York board of health acknowledges the immense value and seeks the cooperation of civic and social organizations in order to get publicity before the greatest number of people. It speaks highly in its bulletins of the neighborhood associations and church and women's clubs. Through the cooperation of several large insurance companies, 3,000 insurance agents distributed in one week public health literature to 750,000 families. California has a California Social Hygiene Society doing excellent pioneer work in San Francisco and other places. This society by lectures, meetings, pamphlets and other special literature, attempts to meet the demand for knowledge on these subjects. Considering its limited means and facilities, much credit is due this society for its accomplishing so much educational work along the line of preventive medicine. Such organizations should be given every aid and assistance possible. I have so far endeavored to speak only of the health side of the venereal problem. But it is obvious that such scientific data, such research work, would be of great value in upbuilding of social and moral conditions. At one point, the point of origin of venereal diseases, all three questions—the health, the social and the moral—coalesce and the health question must welcome anything accomplished by the moral and social sides in lessening the number of infections and if the source of the greater number of infections is clearly demonstrated to be greater from the red light districts, then must the health officer who, if not a sociologist should be at least sociologically inclined, welcome and support such measures as the red light abatement bill.

To return to the health problem and to conclude: The necessity is evident for machinery carefully instituted, scientifically managed and enforced by the proper authorities, to contend with the presence and spread of venereal disease. The suggested bureau for the study and prevention of venereal disease under the State Board of Health, may perhaps best answer. This might be variously named or constituted, or might be without a name, just consisting of adequately enforced rules and regulations under the proper health authorities—but named or nameless, a constructive helpful solution of this health problem is a great thing to be desired.

Discussion.

Dr. George E. Tucker, Riverside, advocated education during the impressionable age in the public school. He considered the stamping out of misinformation given to young men in advertisements and by quacks to be very important.

Harold F. Gray, Palo Alto, gave the following statistics regarding venereal diseases in Palo Alto:

"A special effort was made during the last half of the year to have cases of the venereal diseases reported, with the result that for one half of the year there were reported eight cases of syphilis and thirty-five cases of gonococcus infection. Cases are reported by office number only. The records show that of the eight cases of syphilis, three were contracted in San Jose, one in Sacramento, and one in Bartlett Springs; there were five males, one female, and two infants; four were married and two single; in one case the disease was contracted from the husband. Of the gonococcus infections, eighteen were contracted in San Jose, eight in San Francisco, one in Mayfield and one in Palo Alto; one case was contracted from the wife, and two from the husband; fifteen cases were in Stanford students; thirty-two cases were males, two females, and one infant; six cases were married and twenty-eight single; twenty-six cases were obtained from public prostitutes and five from clandestine connections."

Dr. Stanley P. Black, Pasadena, thought that the reporting of venereal diseases was useless.

Dr. L. R. Willson, Fresno, advocated the teaching of the parents regarding sex matters.

Dr. J. J. Benton, Berkeley, thought that sex hygiene lectures did more harm than good.

Dr. W. A. Sawyer, state hygienic laboratory, advocated the teaching of sex hygiene.

Dr. L. M. Powers, Los Angeles, thought that the teaching of sex hygiene did harm if given before the high school age.

Dr. E. F. Glaser closed the discussion.

WHAT THE STATE SHOULD DO TO DIMINISH TUBERCULOSIS.

CHAIRMAN: Dr. J. J. Benton, health officer of Berkeley, will now present a paper on "What the State Should Do to Diminish Tuberculosis."

DR. BENTON, Berkeley: The problem of lessening the occurrence and also the death rate of tuberculosis has been, and is, one of the most momentous problems with which philanthropists, biologists, clinicians and health officials have had to do. Its prevention and eradication today call forth the most serious consideration of all thoughtful men, whether they be laymen or medical men, for the morbidity from it (in its various forms) is appalling, and its mortality surpasses that of all the other infectious diseases combined. It is, indeed, the great white plague! And, to consideration of the avenues through which the state can render its quota to this end, we invite your attention.

In combating tuberculosis the state must exert its activities in one of two ways—either by indirect supervision, that is, through the municipalities, or by direct supervision.

- I. Indirect Supervision
  - *a.* Things required of municipalities.
    - 1. Reporting.
    - 2. Investigation.
    - 3. Instruction.
  - *b.* Things requested of municipalities.
    - 1. Dispensaries.
    - 2. Camps
- II. Direct Supervision
  - 1. Milk
  - 2. Slaughtering
  - 3. Housing
  - 4. Sanatoria
  - 5. Agricultural pursuits
  - 6. Exhibitions

1. *Reporting.* The state already requires that all cases of tuberculosis be reported upon cards especially prepared for the purpose (and an excellent card it is). But I would like to ask—What health officer present thinks he gets reports concerning even fifty per cent of the cases of tuberculosis in his community? Oh, how often it is that the first inkling of the existence of the disease is received when the death certificate is presented! I can not account for this gross negligence on the part of the physician unless it be because of the great abhorrence the individual patient feels at being known as tuberculous. This is a matter for education of patients by the attending physician who should always hold the health of the community as paramount to that of the individual.

2. *Investigation.* When a case of tuberculosis is reported to a local health officer, he should be required to make as thorough an investigation of the source of infection as is now required in a case of typhoid fever, and as frank an effort made to eliminate the source when discovered.

3. *Instruction.* A deputy health officer, or a nurse, specially trained in such cases, should be sent to the abode of the tuberculous patient to instruct him and his family as to the care of the sputum or other infective material, how to provide for plenty of fresh air day and night and also for sunlight during the day, as well as to his intercourse with other members of the family in order that the chance of communicating the disease may be minimized.

Things Recommended to Municipalities.

1. Every city of more than 10,000 inhabitants should have a dispensary for the treatment of ambulatory cases of tuberculosis. These dispensaries should be under the supervision of the health officer, and the very best and latest medical and hygienic treatment should be given by the most competent persons obtainable.

2. *Camps.* It should be suggested to the cities that a portion of each public park be set aside as a camp for incipient and convalescent cases of tuberculosis in the same manner that playgrounds are now provided and equipped. There these ambulatory patients may spend the greater part of the day, enjoying the open air and sunshine, resting on reclining chairs or cots, or taking short walks.

II. Direct State Supervision.

1. *Milk.* Since Koch gave forth the dictum that bovine tuberculosis could not be transmitted to the human being, investigators, in all lands, have been trying by numberless experiments to demonstrate the truth or falsity of said statement, with the result that authorities unanimously agree not only that bovine tuberculosis *is* transmissible to man, but also (by actual recovery and identification of the bacilli) that from ten to fifty per cent of the cases of tuberculosis in children under seven years of age are of the bovine type. This being the case, it behooves the State to provide means for the elimination of this source of infection. This can only be done by a state law being passed requiring that all cattle in the State shall be tested with tuberculin at least once in six months. This is the only way that a milk supply free from the possibility of tuberculous contamination can be obtained. The truth of this assertion has been brought home to those of us who have attempted to enforce a municipal ordinance requiring that all cows be tuberculin tested before milk is allowed to be sold from that herd. For instance, in Berkeley we found that the percentage of tuberculous cows in the different herds varied from nine to eighty-five per cent, and also that the dairymen found it almost impossible to replace the reacting cows, because farmers would not sell their cows subject to the tuberculin test, and, besides, milk from these same herds could be disposed of in our neighboring municipalities which did not require the tuberculin test. Hence, there was a threatened milk famine in Berkeley. These factors of refilling herds and of the possibility of disposing of tuberculous milk in neighboring communities would be entirely

eliminated if a state law be passed requiring that all milch cows be tested with tuberculin before the milk is sold in California.

2. The other source of infection from bovine tuberculosis is the slaughter house. This business should also be under the direct control of the State, because the varied standards of inspection in different municipalities oftentimes leads to the barring of meat from one community into the other. This was strikingly illustrated last year in the war of words and newspaper notoriety occasioned by the controversy around the bay when Oakland refused to allow meat slaughtered in San Francisco to be sold in Oakland and vice versa. Such affairs are unfortunate, not only because they are detrimental to health administration, but also because they do not lead to uniformity of standard, which, to be of real value, should be the goal of all inspections. This can only be attained by state control or by intercity understanding, and the former is greatly to be preferred.

3. *Housing.* Tuberculosis is most prevalent amongst the lower classes, and hence the excellent tenement house act, which has already been adopted, should be rigidly and energetically enforced. This is particularly true at this time before the influx of immigration through the Panama Canal has been so great as to make the housing problem the enormous task which it is in the east. Will we seize the opportunity?

4. *Sanatoriums.* In the sanatorium the incipient cases are cured and the advanced ones made comfortable. It is also a training school where cleanliness, the love of fresh air and helpfulness to others are the principal lessons taught, and what an influence for good in a community are those returning from these institutions. They become not only useful citizens, but teachers of practical hygiene in their little circles, as well as living monuments to the rescue work of the State.

In our own State ample sites are already available on the grounds of our institutions for the treatment of the insane, and I would suggest that this conference go on record as proposing the establishing of sanatoriums for free treatment of tuberculosis on the grounds of the various institutions for the care of the insane.

5. *Farms.* After a cure has occurred at the sanatorium, the question arises—What shall be done with the individual? Shall he return to his home at once? It has been suggested that he be sent for one year to a farm operated by the State where he can work and live in the open, and thus become fitted to take up the thread of his life where it was interrupted when he left home. This, to my mind, is the necessary complement of the sanatorium.

6. *Exhibits.* In the State Board of Health car there should be an exhibit patterned after that of the International Congress of Tuberculosis and which consisted of photographs, charts, models and pathological specimens, divided into three classes. The first division reads, "Tuberculosis is a preventable disease," and should contain charts showing the lowering of the death rate of tuberculosis from year to year; printed instructions to the tuberculous patient and his family; diagrams and photographs showing the preventive work being done by the State Board of Health.

Under division two—"Tuberculosis is a communicable disease," specimens showing the healthy lung, the lung subjected to inhalation of irritating dust, etc., lungs in the various stages of the disease, and diagrams showing how infection takes place from the drop of moist sputum, whether it be from spitting, kissing or spraying in cough.

Under the third division—"Tuberculosis is a curable disease," should be illustrated by diagrams, photographs and models of the work being done in sanatoriums and dispensaries.

The State should also encourage the educational side of the question by aiding in the dissemination of knowledge concerning the disease by means of lectures and exhibits in the schools.

By the means above outlined the State will save many of the flower of its population and restore them to lives of usefulness and service to others.

Dr. Benton's paper was discussed by Doctors Powers, Black, Corey, Browning, and Willson.

Dr. Benton closed the discussion.

Dr. Wm. C. Hassler, chief sanitary inspector of San Francisco, gave a lecture, illustrated with lantern views, on "What the San Francisco Department of Health Is Doing."

Dr. Allen F. Gillihan, health director of Oakland, showed lantern views illustrating the technique of vaccination against smallpox, and showing cases of confluent smallpox which occurred during the Berkeley epidemic.

There being nothing further to come before the meeting it was adjourned to meet in Oakland in 1915.

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